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Introduction

The remains of the Indus or Harappan civilization of Pakistan and India, dating from about 2600 BC to about 2000–1800 BC, include cities and villages, craft centres, river stations, camp sites, fortified places, and a few probable ports, spread over an immense geographic area, so that the Harappan is said to be the most extensive of the world's earliest civilizations. The sites are found in Sind, Makran, Baluchistan, Punjab, Haryana, north Rajasthan, Kathiawad, Kutch and Badakhshan, in the modern states of Pakistan, India and Afghanistan.

In the literature of archaeology the remains of these sites are often categorized as 'Mature Harappan'. This term refers to the period when the urban centres, crafts and trade of the civilization flourished. It is distinct from both the formative period (termed 'Early Indus' or 'Early Harappan') and the period after the abandonment of the cities and the termination of writing and the crafts (misleadingly termed 'Late Harappan').

The early development of agriculture and animal-rearing and the onset of village life in Pakistan around and after 6500 BC present the first cultural developments that set the stage for the emergence of civilization. During the early period the subsistence economy took its form, some handicraft traditions emerged and, most important, interactions began across various zones of the Indus valley and its surrounding hills and plateaus. The villages of the centuries before 2600 BC were located not only on the Indus plains as far north as Taxila but also in the river valleys amongst the mountains of Baluchistan. (The sequence of these developments is considered in Chapter 9 of this book.)

The Mature Harappan period in its turn was marked by extensive construction in skilled brick masonry of houses, by walls that encircled several settlements, wells, storage structures and other buildings, and also by bipartite urban settlements with high places and lower but more extensive residential areas. There was a characteristic thick and sturdy red pottery. Specific forms of bronze tools such as curved razors, chisels in various sizes and shapes, and flat axes occur across the sites; at the same time there is a remarkable paucity of distinctive tool types in ground stone and flaked stone. An imaginative terracotta art depicting all kinds of animals as well as people offers much scope for sensitive interpretation. Seals give evidence of another level of artistic creativity. These are shaped for easy handling (for stamping) and have rectangular faces carved with pictorial symbols and writing. Other characteristic elements are beautifully cut and polished cubical stone weights that were only one part of a uniform weighing system; marine shell and ivory with multiple uses including as ornaments and domestic artefacts; baked clay missiles and flat 'cakes' for paving floors and for heat retention at fireplaces; and ornaments made of faience, bronze, silver, gold and semi-precious stones of attractive colours. Culturally significant is a logo-graphic system of writing.

Amongst the features that make the Harappan civilization unique in the third-millennium world are its baked-brick urban buildings and architectural skills, the weight system that appears to have been standardized from the beginning, and the long distances overseas that Harappan materials reached. Other than exceptionally large urban houses there was also water harnessing on an unparalleled scale with probably hundreds of wells sunk, say, twenty metres deep, in the city of Mohenjo-daro. Artificial lakes or tanks were constructed at Dholavira on an island in the Rann of Kutch. The abundant water supply to habitations—we may recall the frequency with which paved bathing floors occur in Harappan houses—would have served not only personal and domestic needs but also, probably, ritual performance. For, the only building identified with some degree of certitude as a religious unit is the Great Bath of Mohenjo-daro, its floor so well paved that we cannot doubt that it held water. Planned water supply to the residential area entailed, in its turn, a system of carrying away used or waste water from the houses: the street drainage

system of Mohenjo-daro is unique to the ancient world.

Despite this, the Indus civilization does not appear quite as spectacular as the Egyptian, Mesopotamian or Chinese: it has not yielded treasures (such as enormous bronze vessels, gold jewellery, elaborate stone ornaments) on any comparable scale. Harappan religious thought and practice apparently had no place for ambitious funerary structures like pyramids or for the burial of sumptuous offerings for the dead. Neither did Harappan religious life entail the construction of richly-appointed temples. However sumptuous the lifestyle of the Harappan elite, the archaeological record is unlikely to reflect it because in Harappan culture there seems to have been no place for ritual/mortuary burial of wealth.

Reliance on copper and copper alloys (with tin, lead or arsenic) in the Bronze Age civilizations including that of the Indus has a significance we need to appreciate in order to understand the place of the Harappan civilization in the history of South Asia. Copper and bronze were essential for tools of production of several handicrafts (if not in agriculture). However, copper, tin and lead are scarce in the world, tin especially so. They are not to be found in the rich agricultural heartlands of the Indus, Nile or Euphrates valleys, and only occasionally on their immediate fringes, in northern Rajasthan for example. The Harappans would have obtained some tin from as far afield as Afghanistan—and the presence of their artefacts in Oman across the Arabian Sea can reasonably be explained as a quest for copper there. Thus, an economy based on bronze technology is different from one based on iron. Iron is the most abundant metal in the earth's crust: it is to be found in hundreds of localities in India and Pakistan, and as the iron age civilization of the first millennium BC emerged in the Gangetic plains several iron sources in the immediate vicinity of this zone—such as the Agra–Gwalior tract—were utilized.

As a rule of thumb we can, therefore, suggest that technological and economic systems based on copper/bronze as a critical raw material for tools were more fragile than those relying on iron. For one, mechanisms of long-distance procurement had to function with some degree of cost efficiency; for another, bronze technology required centralized organization and control (even as late as the Mughal period), which iron production did not.

In some parts of the world the traditions of the Bronze Age

endured. The pantheons, writing systems, architectural techniques and styles, and literary traditions of the Egyptians and the Mesopotamians, for example, saw continuity into the iron age (first millennium BC). But not so the Harappan or the Turkmenian (Central Asian) Bronze Age tradition, where not just technologies but also the occupation of towns and villages were disrupted on a large scale. The state and the organization of the urban, overseas-trading economy in the Harappan world disintegrated, and what followed were local or regional rural cultures without exquisite seal carvings or complex brick residences or domestic artefacts and ornaments of ivory, not to speak of the absence of writing and uniformity of weights.

Long-term cultural continuities in domestic architecture, alphabetic writing, vertical drainage systems in towns, coinage, methods of sealing and representational art styles are discernible in South Asia from the iron age onward. The Harappan legacy, in contrast, was a fragmented one, strongest in the sphere of the subsistence economy. The crops and animals on which Harappan wealth was based (wheat, barley, lentils, peas, cotton, sesame, and humped cattle, goats, sheep) continued to be of importance in the Ganga valley and other regions in the first millennium BC. In contrast stand the end of the traditions of sculpture, writing, architecture and, presumably, also seafaring. The most outstanding feature of the iron age, however, was its settlements and the continuities in settlement pattern. Early iron age settlements developed at and around nodes like Taxila, Mathura, Kausambi–Srīngaverpura, Varanasi, Bhagalpur and Ujjain; these retained their political, strategic or commercial importance into the first millennium AD and even later. Rajghat (Varanasi), for example, was occupied from 800 BC to about AD 1200; Srīngaverpura from pre-iron levels to AD 1700; Atranjikhēra from pre-iron levels to about AD 1100; Ayodhya from the iron age (with breaks) to the medieval period. But never did the neighbourhoods of Dholavira, Mohenjodaro or Harappa, after the Harappan period, become the political cores of states or the nodes of subcontinental economic networks.¹

¹ The outlying Harappan settlement of Shortughai on the left bank of the Oxus, in Badakhshan, may be some kind of exception. A short distance downstream of this site lies the fortified Hellenistic town of Ai Khanoum, in the midst of an extensive urban sprawl. But Ai Khanoum too was deserted after about 150 BC and there is no Kushana occupation there.

As regards the chronology of the civilization, it may be useful to take the cultural sequence as revealed by recent excavations at the site of Harappa as the starting yardstick. The stratification is accompanied by the radiocarbon dating of almost a hundred samples at the site. Beginning with the earliest level at the bottom of the sequence, we have:

Late Harappan	1800 BC onwards
transition between Mature and	
Late Harappan	1900-1800 BC
Mature Harappan (three phases)	2600-1900 BC
Early Harappan (Kot Dijian culture)	2800-2600 BC
earliest occupation ('Ravi' culture)	3300-2800 BC

Let us now proceed to a few preliminary definitions and concepts, before we explore the enigma of this Bronze Age civilization.

Concepts and Parameters

'Harappan' Sites and Civilization

The earliest sites of the Indus civilization to be discovered were Harappa and Mohenjo-daro on the plains of the Indus river system. In the 1920s it was recognized that these two places represent a past civilization of the same level (city life, writing, dependence on bronze and stone for tools) as those along the Nile and Euphrates rivers; and the new discovery was categorized as one of the great river valley civilizations of the world. Just as the civilization of the Pharaohs was distinctive of the Nile, so this civilization was distinctive of the Indus. (Moreover, it was found to be in 'very close contact' with the Mesopotamian civilization along the Euphrates, as indicated by small finds like seals and beads.)

Subsequently other sites were discovered not only in the Indus valley but also in regions like Kathiawad, and some scholars thought it best to name all those sites that appeared to yield the same range of antiquities 'Harappan' sites—after Harappa, the type-site.¹ (The naming of related sites after the one that was first discovered is a common convention in archaeology.) Also, despite many later

¹ The ruins of Harappa were discovered in the early nineteenth century, but it was only in the 1850s that A. Cunningham published the artefacts he found there. For Cunningham, the seals from Harappa bore a kind of writing that was 'certainly not Indian' and were thus 'foreign to India'. In the early twentieth century Daya Ram Sahni began systematic excavations at Harappa, and in 1921 R.D. Banerji began excavations at Mohenjo-daro. Although these archaeologists had stumbled on an entirely unknown period of the past, they were quick to realize that both these sites represent the same culture, one that is substantially earlier than the Mauryan period.

discoveries, Harappa and Mohenjo-daro remain the largest sites with the richest artefactual remains and the most elaborate architecture. They are likely, therefore, to have been economically or politically central, even dominant, places. Thus 'Harappan' is a satisfactory label.

It has often been suggested that this was the civilization of the Sarasvati river, not the Indus. Vedic literature gives importance to a river known as the Sarasvati which, it is said, flowed from the north-east towards the lower Indus through what are now the provinces of Haryana, north Rajasthan and Bahawalpur, and is identified by the mostly dry river bed that is known as the Ghaggar in India and, further downstream in Pakistan, as the Hakra. It has been said that there are several relic mounds of the period (Kalibangan, for example) spread along the banks of the Sarasvati system, more sites than along the alluvial valley of the Indus. Thus it has been claimed that what we have here is the 'Sarasvati' rather than the 'Indus' civilization. The difficulties with this suggestion are as follows. First, fewer Harappan sites lie along the banks of the Ghaggar-Hakra than is made out. Second, there is no proof at all that the mighty Sarasvati of the *Rgveda* was in fact this (now dry) river—the identification is itself open to doubt. Third, when active the Ghaggar-Hakra was in any case a tributary to the Indus. Last, the term 'Sarasvati' conjures up a kind of identity between the culture reflected in the Vedic literature and that excavated at Harappan sites when, in fact, there is hardly any correspondence. The label 'Sarasvati', for all these reasons, is difficult to defend on scholarly grounds.

It may well be asked, in response to the statement above that there are not as many Harappan sites on the plains of the Sarasvati system as has been claimed, how numbers of sites can be disputed. The problem lies in defining them as 'Harappan'.

On excavation a site yields stone or brick walls, patches of floor, broken pottery, stone tools, metal artefacts and so on. These finds are grouped into categories or types in archaeology. For example, according to criteria such as clay, surface treatment, painted designs and shapes, we classify pottery as 'coarse grey cooking pots' or 'fine wheel-turned vases painted with black geometric designs'. Sites with the same specific types or classes of artefacts are grouped into the same archaeological 'culture'—e.g., the Harappan culture.

Such classification, however, is not always simple and straightforward. The main reason is that until very recently all tools, pots, ornaments and weapons were made by hand, and therefore no two could be identical. We need to isolate certain features of an artefact and examine how these features co-occur with others. We may take the Harappan seals as an example. A large percentage of them are made of steatite; they have a rectangular face; on this is deeply carved out the figure of an animal and a line of writing; and on the reverse is a projecting and perforated boss. We can then doubt whether a round seal made of baked clay, with no boss, and showing one or two signs on its face but no pictorial emblem, can be called Harappan, even if the signs resemble Harappan writing.

Further, if in an ancient mound we find only one pot and two bead necklaces similar to those of Harappa and Mohenjo-daro, with the bulk of pottery, tools and ornaments of a different type altogether, we cannot call that site 'Harappan'. It is, instead, a site with Harappan contact, a settlement of people with a different culture who were neighbours or contemporaries of those who practised what we call the Harappan culture. Where the Sarasvati valley sites are concerned, we find that many more of them are sites of a local culture (with distinctive pottery, clay bangles, terracotta beads and grinding stones), some of them showing Harappan contact, than full-fledged Mature Harappan sites.

There is no written documentation from our region on this period, as the Harappan script remains undeciphered. Even if it were to be deciphered the information recovered would be meagre, given that the available inscriptions are so short. Harappan writing survives on imperishable steatite seals, pots, baked clay bangles, shell bangles, copper tablets, a few copper tools and ivory rods, but it is not impossible that long texts were written on birch bark or on leaves, materials that do not survive in habitation mounds. What archaeologists find is hardly ever representative of the total materials and artefacts used in the past.

Mounds that survive as the remnants of ancient villages or towns preserve quantities of brick, often still in place in walls, pottery fragments or sherds, and stone tools, all made of inorganic and hence

imperishable materials. Metal too is inorganic² but tends not to occur in the same quantity as brick or pottery. The reason is that pots break easily and are freely discarded as they are replaceable, being made of the clay available in most places. Metal, however, is scarce on the face of the earth. Also, it can be heated or melted down and recycled. When in the past copper, bronze or gold artefacts broke, people would have preserved the pieces until such time as they could be melted and refashioned into new objects. Unless deliberately buried as secret treasure or with the dead, or as ritual deposits in caves or temple foundations, metal artefacts therefore tend to be under-represented in archaeological remains. In fact, much of the jewellery from the major Harappan sites occur in a few hoards or caches, treasures secreted in pots and hidden under house floors and for some reason never recovered by the person(s) who hid them.

The archaeological record thus contains, in large part, things that ancient people lost or discarded; there is more garbage than treasure to be found and every cache/hoard is a 'bonus' that affords a glimpse into an aspect of material culture that we are not usually likely to find.

Let us consider, next, the fact that archaeology only deals with the material aspects of a functioning culture, not with the manners, the traditional songs or verbal art that give a group its distinctiveness amongst several groups. Material things are but a fraction of any living culture and surviving material remains are only a fraction of the total material component. (Hairstyle, dress, leatherwork, art in the form of woven and embroidered textiles, etc., do not survive burial in ancient mounds, except when soil conditions are exceptionally dry or ice-bound.) Thus the archaeologist gets to deal with only a small—and rather skewed—fraction of an ancient culture system. It follows that only limited questions can be meaningfully asked about the Harappan civilization.

Context

In order to surmount the difficulties of an incomplete material record, we can refer to better-known cultures of the same period. Since its discovery, the Harappan civilization has been interpreted

² Copper, however, can be eaten away by corrosion.

and understood against the background of contemporary Bronze Age civilizations, on which much written evidence is available. Egypt and Mesopotamia had their own writing systems and each of them has left many records in a language and script that have long since been deciphered. For example, we know that in these civilizations people were mobilized in groups to build pyramids and temples; that these river valleys were ruled by kings who prided themselves on their prowess in warfare but also engaged in pious acts like dedicating statues to gods and building or repairing temples. Texts from both regions reveal the importance of foreign timbers and exotic stones and metals, to procure which kings would send their subjects abroad; it is clear that Mesopotamian and Egyptian scribes were ordinary men with little power; in shreds and patches the literature of Mesopotamia reveals the cultural valuation of urban life, indeed the lure of the city and its brickwork; hundreds and hundreds of written tablets about the Mesopotamian state administration reveal that up to 2000 BC there was no tax on the harvest taken in by villagers—instead, rulers deployed labour on temple and palace estates to produce large quantities of grain, textiles, dairy products, fish and craft items.

We do not need to grope in the dark about every single aspect of the Harappan culture. Given what we know about Egyptian and Mesopotamian literacy, for example, we may infer that in South Asia there could not have been total literacy, neither would the knowledge of reading and writing have been the secret preserve of priests; that a tax on harvest produce was unlikely; that polities could have been organized as states under kings. Such parallelisms are based on what can be reconstructed of the structure of a Bronze Age society (see Chapter 8).

We are also fortunate to know that for the Mesopotamians South Asia was the land of 'Meluhha'. Stray allusions to Meluhha in myths, legends, epics and royal inscriptions give us tantalizing leads. Occasionally a Mesopotamian king would set up an inscription in a temple recording the fact that ships of Meluhha (as also other lands) docked in the quay of his capital on the Euphrates. In a variety of contexts Meluhha is named as the source of ivory, wood, gold, lapis lazuli, and 'tempting, precious carnelian' or 'pure Meluhha carnelian'. One text calls the Meluhhites who brought their wares to Mesopotamia people of the 'black mountain' or 'black land'. Specific kinds of

boats were of the Meluhha variety and there is even mention of a 'speckled dog' which is said to be of the Meluhha kind.

There is a Mesopotamian myth in which the god of the underworld, Enki, blesses several regions such as Mesopotamia, the steppeland to its west and north, and the land of Meluhha. Enki's benediction for Meluhha is: 'Black land, may your trees be large trees, may their thrones fill the royal palace. . . . May your heroes at the place of battle wield their weapons; may your bulls be large bulls. . . . May your bird be the *haja* bird, may its call fill the royal palace.' Our immediate inference would be that cattle were important as also fine wood for special furniture. The *haja* bird was perhaps the peacock. But why the land was associated with blackness is not known; the easiest explanation is that the people were dark-skinned.

We will take up the subject of Harappan external relations in Chapter 3 but at this stage it needs to be said that, given the wealth of information on their neighbours and the fact that the Harappans were in interaction with people of other civilizations, it makes sense to study South Asia in the context of the Bronze Age (third millennium BC) world. There is an additional point. In the 1940s and 1950s Gordon Childe (who was the first to construct a theory of the Bronze Age) concluded that economic systems dependent on bronze technology would necessarily have had to organize long-distance metal procurement. Economic growth in an elite-centred and elite-organized Bronze Age system would have taken the form of outward expansion rather than intensification within. Childe pointed out marked similarities in the near-contemporary civilizations of Egypt, Sumer (Mesopotamia) and the Indus valley: all were 'based on the same scientific discoveries' and, as we know of interactions between the three areas in the period just before the Bronze Age, this cannot have been a coincidence.

Dating

Interactions between the various parts of the third millennium world also help the archaeologist to establish cross-cultural synchronisms. That is to say, if an artefact typical of one culture and so recognizable is found at a site of another culture, the two cultures are (by inference) at least partly contemporary. The ancient Mesopotamians wrote on tablets of imperishable clay and thousands of these written

in the third millennium BC have been studied by modern scholars. Sumerian and Akkadian, the two languages in which they were written, are fairly well understood today. Many of the tablets carry a date: the day and month of a particular year of the reign of a particular king. (A year would be named 'When King X conquered the land Y' or 'Year in which A became king' or, in the second millennium, 'tenth year of king Z'.) Mesopotamian scribes compiled several lists of the named years of kings, lists of kings who succeeded one another and the duration of their reigns, and lists of dynasties contemporaneous with one another. Present-day scholars have pieced together from this information a sequence (with remarkably few gaps) of rulers and dynasties from roughly 2500 BC to the end of the pre-Christian era.

This is not all. The science of astronomy was well developed in Mesopotamia and there are texts that record observations of Venus over several years, or a solar eclipse in a particular month of a particular regnal year of a certain king. Modern astronomers calculate for us the precise dates, according to the modern calendar, on which those phenomena would have occurred. Thus we come to know the 'absolute dates' in years BC of the rule of a particular king, and can calculate backwards and forwards the calendar dates of other rulers and dynasties listed before or after him in the king-lists and dynasty-lists. Radiocarbon dating of stratified remains at Mesopotamian sites on the whole confirms the dates ascertained by such methods. With a margin of error of little more than a century, the Mesopotamian chronology is eminently reliable.

Synchronisms with Mesopotamia in fact helped archaeologists to a large extent to establish the date of the Harappan civilization, ever since its discovery. The points of correspondence are: (i) recognizable Harappan items at Mesopotamian sites, and (ii) references to 'Meluhha' in the royal inscriptions of rulers whose dates are known. Here are a few examples. First, Sargon, king of Akkad in central Mesopotamia, recorded that boats came to Akkad from Meluhha. Sargon ruled from about 2370 to 2315 BC. The second example is a cube of polished chert stone which is a Harappan weight of 13.5 grams. It was found in a deposit dated 2150–2000 BC at the southern Mesopotamian town of Ur. A third example is some carnelian beads, decorated in characteristic Harappan fashion, found at Ur in royal burials which date about 2600–2500 BC.

Along with such cross-cultural synchronisms there are dozens of radiocarbon dates of charcoal and other material from Harappan sites, calibrated to internationally agreed values. Used with discretion, these confirm the time bracket 2600 to 1900 or 1800 BC for the period of urban culture, or what is called the Mature Harappan period. This chronology is of course subject to modifications but they would not invalidate the argument in the following pages.

'Civilization'

We do not use the term civilization here to refer to refined or sophisticated or 'cultured' people, as in current usage. All human societies, however technologically 'backward' or small in population, by definition have culture—for culture refers to socially inherited ways of acting, eating and building habitations, to language and ritual performance, marriage systems, materials and their use and value, and so on.

In another usage, 'civilization' refers to the age-old divisions between major cultural traditions and styles, such as the Arab civilization as distinguished from the Chinese or Indian civilization. In this sense the term refers to a region that derives its personality or distinctiveness from its geography and its past.

For our context 'civilization' has a somewhat different and two-fold connotation. In the first place it refers to a stage of advancement of society, from one-room huts to the architecture of complex buildings, from oral traditions to literacy, from rural households to city life, and from reliance on stone to metals and stone. The Harappan sites testify to sophisticated architecture in a range of building materials, usage of several kinds of stones, shells and metals, a writing system, city life, formal styles of sculpture, and other characteristic marks of civilization in this sense.

'Civilization' in the second sense refers to geographic scale—to a number of local groups using the same writing system or art codes or metallurgy or sets of craft techniques. What we have in mind are archaeologically manifest regularities over an area, a degree of unity over a large region in spite of differences in local detail. As we have said, the Harappan culture is archaeologically attested to cover an amazingly large area: between Makran in the west and Haryana in the east, and from Badakhshan in the north to Kathiawad in the south.

It also needs to be said that civilization presents a contrast to tribal society, which is basically 'pre-class' society. The emergence of civilization in the third millennium meant the advent of states and city life. City life is not compatible with the simple household economy, replicable villages and equal access of all members to basic resources that characterize tribal society. Civilization as defined here is possible only when there emerges a ruling class that can dominate and exercise coercion over the populace, and also tend the cults and rituals with feasts or sacrifices; when rulers organize the inter-regional flow of goods, and set the artistic and linguistic norms.

Before the advent of civilization, in tribal societies it was mainly the solidarity of kinship that acted as a cohesive force. Human relationships in these small-scale societies were personal: there were face-to-face dealings among those known to one another, mainly as kinsmen. The importance of blood connections (brother-sister, elder-junior, husband-inlaws, mother's brother-sister's son, etc.) and the corresponding rights and duties, respect, expectations and obligations—in short, the morality of cooperation and generosity that went with such blood connections—constituted the social fabric, as it were. Tribal cultures were correspondingly limited in their geographic scope and the scope of interpersonal interaction. In the stage we call civilization, on the other hand, individuals are, in many spheres of life, bound together on the basis of mutual usefulness (and also coercion). There now is, as one scholar put it, 'institutionalized provision for the stranger'. There is a division of labour which brings about mutual dependence within and between localities, and there is also the threat of use of force by the ruling power. 'Society' is a number of previously small and separate (and relatively self-sufficient) tribal groups and regions that have lost some characteristics of their past and unique cultures but retained others. At the same time, there are new, formal institutions to express the new order—laws and the concept of law, hierarchies of command, administration, religious office, and an aesthetic code—that come into existence with the incorporation of diverse groups.

Historians refer to rural groups incorporated within a state or elite-controlled polity as a peasantry. Peasants retain some of their old customs and techniques of production but also participate in one way or another in the new order. Harappan peasants could have

surrendered their labour to the god or king for production on state-lands or in craft workshops on royal or religious estates, or in the building of city walls; they could have availed of goods or services in the cities and benefited from rituals and cults. The laws of governance, military preoccupations and dispute settlement mechanisms of the elite would have impinged upon rural life to a greater or lesser extent.

We have referred to relationships of utility as the mark of civilization. An 'organic solidarity' comes about, based on the dependence of various persons and social roles on one another. A bead-maker in Mohenjo-daro, for example, would have required bronze tools from the metallurgist, plus bowls and jars for heating stones and making paste from the potter. Metallurgists and potters in their turn would not have needed to travel out of the city every day to collect sticks and wood to make charcoal for their fuel. Fuel supply is very likely to have been a separate mechanism on which several artisan households depended.

The urban centre, in history, has been the obvious setting of such specialization and interdependence. Cities are not just large settlements. In an urban society the population is spread unevenly over the region, in large and small settlements; some people aggregate or cluster in a few settlements (cities) that are much larger than the rest. Thus a settlement-size hierarchy takes form. Such clustering of people at a few nodes on the map does not make sense in the context of food production: several small villages are a more rational spacing for rural households and the fields they cultivate. (As an agricultural village grows in population a correspondingly large area would need to come under cultivation; the fields of some families would then be at a great distance from the village residence, necessitating time-consuming journeying to and from the fields. Under such conditions new villages tend to bud off from parent villages instead of the latter growing to such a size that movement and transportation between residence and field become difficult.)

Population nucleation is of advantage only when the aggregate costs of transportation need to be reduced. Households relying on the same metals/metal tools/fuels/stones would benefit by location in the same place. And it would be in just such a place that craft

skills are acquired, practised and transmitted down the generations. It is this that gives cities the connection with crafts and trade.

Yet, no ancient city in the world housed only craft producers and merchants; there was always an agricultural and stock-raising population in the urban centres of the ancient world. Specialist seal-cutters may have had skills that few others shared, but this does not mean that they were totally delinked from any kind of subsistence production, or that seal-cutting was a full-time occupation. In any case, the ancient city was also a political centre, the residence of the ruler, the defended node, the place of quick recruitment for warfare, as well as the place of large temples or annual sacrifices or ancestral feasts. Ultimately, a definition of the city rests on interactions of utility between strangers. City life is thus qualitatively different from life amongst kin in a tribal village.

The best example of this contrast is provided by the street drainage system of Mohenjo-daro. Drains or gutters, some of them no more than twenty-five centimetres wide so that they could be covered by available bricks, were dug into the streets either just below street level or, say, half a metre below. They ran along the streets for the discharge of dirty water from individual houses. Street drains met other drains so that the combined waste was ultimately discharged into sumps at a few points in the city, or perhaps outside into the plain. For such a system to work, (i) every household would have to be incorporated; (ii) the system from start to end would have to have the requisite overall slope—at Mohenjo-daro it was on average two centimetres to the metre; (iii) no extra-steep gradients or repeated sharp angles in drain alignments would do; and (iv) the system would have to operate continuously in a sustained fashion. For example, cess-pits, provided at intervals along a long drain to take solid matter and facilitate flow in the drain, would need to be cleared out regularly. All this meant that the drainage of Mohenjo-daro was a public utility. It was not something individual households could create piecemeal on their independent initiative. A street drainage system needs to be constructed on a preconceived plan and needs to run as an extra-household facility. Thus, in many ways, the Bronze Age city embodies the great transformation that had occurred in economic, political and social life.

The Bronze Age

It now remains for us to discuss Gordon Childe's term, 'Bronze Age'. Just as palaeolithic sites are understood to be the vestiges of hunters and gatherers, and neolithic and chalcolithic sites represent the agricultural and animal-rearing villages of tribal groups, so too the 'Bronze Age' means a specific social form. The important matter is not the distinction between copper and its alloy (with tin or lead), bronze. When stone tools are the main tools of production and copper is of incidental utility, the relevant cultures are called 'chalcolithic'. In the Bronze Age, however, copper/bronze was in regular use in the tools of production. In terms of social organization there is, thus, a marked difference between chalcolithic and Bronze Age societies.

The development of bronze metallurgy involved knowledge of copper and tin/lead mining and smelting, alloying, and casting—all techniques that require experience of ores and pyrotechnology (that is, fuels, temperatures, reduction or oxidation conditions in a kiln, fluxes and different non-metallic stones, and also of the varying quality of the charcoals of different woods). Moreover, as we have said earlier, copper, tin, arsenic and lead are much more scarce than metals like iron, and each would have had to be procured from a distant place. Such technological resources were not readily accessible to the typical tribal household unless it had regular external interaction with towns or elite groups.

Metal tools could be made in sizes and shapes not possible in stone. For example, they made possible skilled carpentry and the fine carving of stone seals or ivory. Again, it is not difficult to comprehend why the locus of the technological and economic transformation was the Bronze Age city, or why the Bronze Age economy was essentially one with sustained—and often expanding—external trade.

Stone Age, - Bronze Age, - Steam Age, -
Electric Age, - Nuclear Age, - ?

2

Harappan Settlements in their Setting

The preliminaries over, our first topic is the spread of Harappan sites over the landscape. As we consider the location of villages and towns in relation to rainfall, river regimes, ground water, soils and mineral resources (stone, wood, shell, metal), basic features of the economy will be discerned.

On the whole the sites of this civilization are spread over a zone characterized as 'semi-arid', with a rainfall insufficient for crops. The greater Indus valley receives some rainfall in the monsoon months and some also in the winter from low-pressure belts that originate in the Mediterranean (and give rainfall to western Asia before they reach Pakistan-India), though there is a deficit for the winter crop. The Indus valley lies on the eastern fringes of a huge region across western Asia where winter cereal crops like wheat and barley, and livestock like cattle, sheep and goats had for several centuries been the basis of subsistence. Correspondingly, Harappan agriculture focused on winter (*rabi*) crops: wheat, barley, mustard, linseed, peas, lentil, gram. At the same time, since the Harappan zone occupies the western fringes of the southwest monsoon zone of South Asia, the summer-growing sesamum and cotton, and perennials like beans that were native to South Asia are also attested. Summer-growing millets, and also rice, were perhaps eaten in some pockets.¹ Date-seeds and

¹ Available evidence indicates that rice (identified at Rangpur and Lothal in eastern Saurashtra) became an actual crop only in the second millennium BC in South Asia. Of the millets, coarse-grained and hardy plants suited to tracts with low rainfall and poor soils, foxtail or Italian millet is known in Harappan Kutch either as a weed or a wild plant. The more nutritious jowar and bajra were to be crops of a slightly later period but ragi was perhaps being grown around this time in Saurashtra and Kutch.

ber have been identified. Fibre and oil could have been extracted from cotton and sesame, and oil from linseed (which may have been western Asiatic in origin) would have been used for lamps rather than for food.

The question that comes to mind is whether the climate in 2500 BC was the same as that today. In the 1970s, palynological studies² were made of lake sediments in Rajasthan and it was concluded that between 3000 and 1800 BC there was more summer and winter rainfall than there is today. This conclusion has been contested, as the archaeological sequence and pattern of settlement in north-western India and Pakistan—Rajasthan in particular—in pre and protohistoric times show no correspondence with the dry and wet cycles inferred from the pollen data. Also, changing frequencies of tree and shrub species, represented by their fluctuating pollen counts, are not a direct measure of rainfall fluctuations: they merely indicate that rainfall could have varied between periods. V.N. Misra states, 'increased rainfall was not a decisive factor in the rise and growth of the Harappan culture'. His view is reinforced by pollen frequencies at the Harappan site of Balakot near the coast in Pakistan, which indicate that rainfall patterns in the third millennium were on the whole similar to those of today.



View from the top of the Mohenjo-daro citadel, of the countryside to the west

² In brief, palynology involves the identification of pollens trapped in a series of superimposed lake sediments, from which the changing plant life over the centuries in a region can be reconstructed.

The elephant, rhinoceros and tiger, all of which inhabit forests, are among the animals depicted on Harappan seals. But today the Indus plains around Harappa and Mohenjo-daro are covered by cultivation and sparse thorny tree growth (acacias and Capparis or kirirr) rather than dense forest. The past environment would have been more lush in terms of trees and animals not because of better climate but because people had not yet cut their way on any massive scale into forested areas. Dense forest would have hugged the banks of the Indus in Harappan times. As late as AD 1333 an Arab traveller saw a rhinoceros in Sind, and in later centuries the British hunted tigers in the Indus valley.



The banks of the Indus near Mohenjo-daro. The limestone spurs in the foreground were recently installed to protect the site from floods.

Returning to agricultural production, we cannot assume that the agricultural ecology of the Indus was similar to conditions in the Nile or Euphrates valley. There are, in fact, major contrasts. The Indus is the largest of the three rivers with an enormous catchment and a great depth of alluvium deposited on its vast flood plain. It is an enormously destructive river, proportionate to its catchment and volume of water. Through history it has had major shifts of course across its valley. We do not know the precise course it took in Harappan times but up into the early historic period much of the water of the Indus system was discharged into the Rann of Kutch.

The Nile is, in contrast, predictable and tame. It floods its extremely narrow valley between late June and September with a fair degree of regularity, the water standing in the fields for several

weeks and then subsiding, thoroughly wetting and fertilizing the soil before it is time to sow. Wheat and barley require no further irrigation, even though Egypt is a hyper-arid land with less than ten centimetres of rainfall per year.

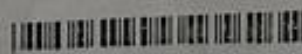
The Indus too floods in the summer months, well before the wheat and barley sowing. It is at its highest level in August. But its annual water discharge is 207 billion cubic metres as against the 63 billion cubic metres of the Nile. Its catchment in the Himalaya is several times the magnitude of the Nile or Euphrates catchment, and it carries a huge amount of water at great speed. In just one decade in this century its August floods destroyed 3000 villages. (Today the Indus has been 'tamed' by numerous flood-protective *bunds* along its banks.)

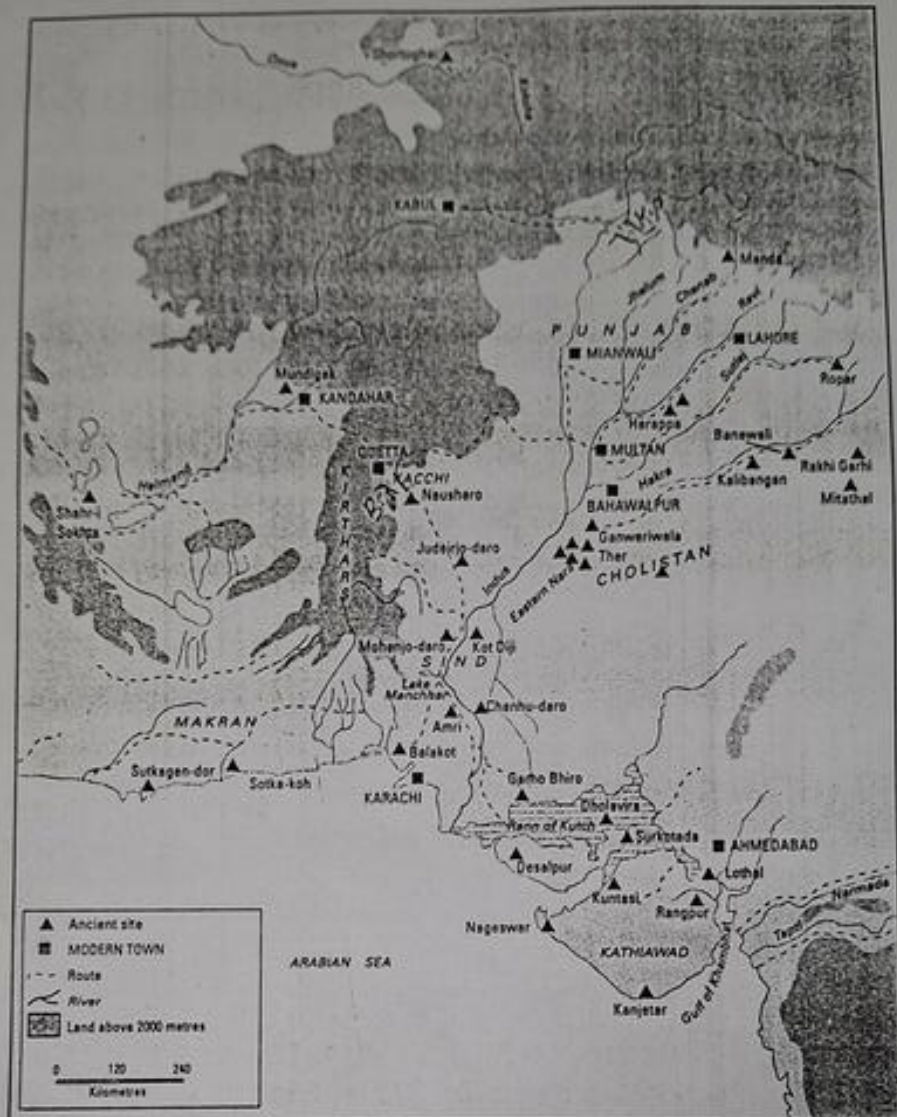
205/10 The ancient Mesopotamians were able to take water from the Euphrates to their wheat and barley fields in canals or ditches because the level of the river is high in the agricultural months. But the Indus is lowest while the *rabi* crops are in the field and until the advent of modern technology gravity-flow canal irrigation was not possible for winter crops. In some low-lying areas, however, the remnant flood waters of the Indus could stand for several weeks, 'irrigating' the tract adequately for the *rabi* season to follow. Over the western Indus plain today stand numerous bodies of still water, or bow lakes and cut-off meanders. But the valley of the Indus is wide and monsoon flooding could not have been either predictable or regular. A patch inundated in one year could have been left dry in the next. Until about 1900 the cultivated area fluctuated from year to year according to rainfall and river flow.

Let us now consider the different zones of Harappan settlements (see Map 1).

Preliminary reports have come in of Harappan sites having been discovered in Shekhupura district, opposite Lahore, on the right bank of the river Ravi.

M.R. Mughal discovered 83 habitation sites along the now dry Hakra channel in Pakistan, which flows southwest and then turns south to flow parallel to the Indus. It may have joined the Eastern Nara channel in the third millennium, or else it had an inland 'delta' not far from the east bank of the Indus in Cholistan. Most of the Harappan sites lie downstream of the medieval Derawar fort. The

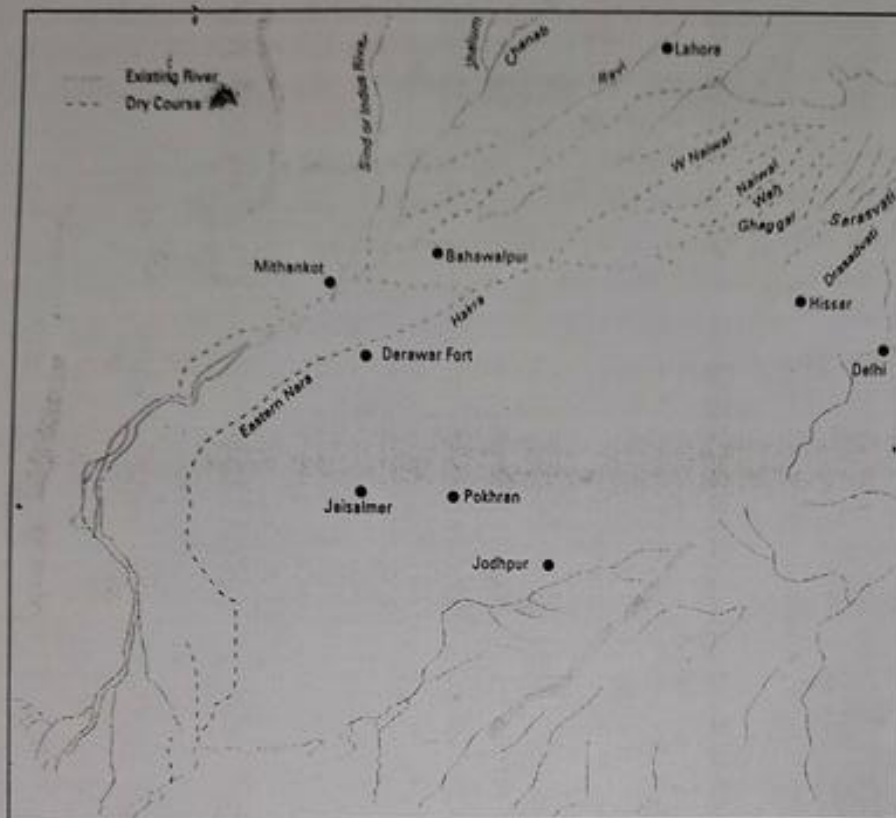




Map 1: Location of Some Mature Harappan Sites

largest of them, Ganweriwala, like Harappa and Mohenjo-daro, has a 'citadel'³ distinct from the main residential area. The town remains cover about forty-two hectares and lie near the southern edge of the cluster of Mature Harappan sites. There are other habitation sites, camp sites, and sites with remains of kilns for the production of brick,

³ This term was first used by Sir Mortimer Wheeler for the smaller but higher sector of many a Harappan city, often walled in by a brick or stone perimeter.



Map 2: The 'Ancient Sarasvati' System after V.N. Misra

metalware or pottery. Little excavation has as yet been done at any of these sites.

The Hakra has been identified (though not conclusively) as the lowest stretch of the ancient Sarasvati river, whose channel in Indian territory is known as the Ghaggar (see Map 2). In Harappan times there was an appreciable flow in this channel because it received streams that today feed the upper Sutlej and the upper Jumna. The Sarasvati and its Drasadvati or Chautang tributary are purely rain-fed because of their origin in the Shivaliks (not the high Himalaya),⁴ and must have been less destructive than the Indus.

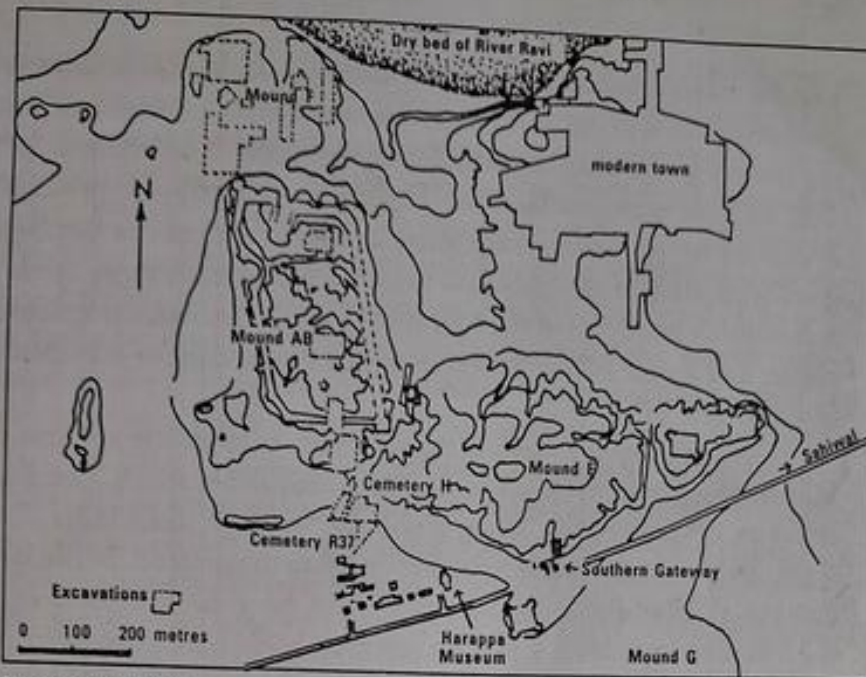
⁴ Originating in the Shivaliks, the Ghaggar joins, near Rasula, a small stream known as the Sarasvati; further downstream the combined river is joined by the Chautang or Drasadvati from the east. The combined Hakra stream is fed, near the India-Pakistan border, by the joint channel of streams known as the Naiwals from the northeast. Today these rivers are perennial only up to a short distance from the Shivaliks.

Besides, the lower Hakra stretch is blessed with a rich reservoir of subsoil water. Several medieval forts mark the location of perennial wells to which mobile pastoralists take their cattle. Ground water would have made up for the deficit in rainfall (on average 12.5–20 centimetres per year).

That the largest and densest cluster of known Harappan sites occurs on the Hakra may only be due to the fact that ancient mounds have a much higher chance of survival along a defunct river than along the banks of active and periodically flooding rivers. (Many sites near the Indus may have been washed away when the river flooded or changed its course. Sites like Desalpur in Kutch, on their part, have been sliced through by small rivers which have slightly changed course after the Harappan period.)

On the central Indus plains, a site near Mianwali, plus Harappa, Kalibangan and Banawali mark the northern frontier of the main settled area. There are only a few Harappan sites further north and northeast, even though winter rainfall further north is higher and often adequate for the *rabi* crop. In the northern frontier zone itself rainfall is on an average twenty-five centimetres, not always adequate for winter cultivation. Records of the British period show that in the area around the large site of Harappa (120 to perhaps 150 hectares), where there may be eight rainy days in a winter month, wheat fields were irrigated by water drawn from wells by oxen.

The vast site of Harappa, about twelve kilometres south of the present course of the river Ravi but closer to an ancient flood channel of that river, is today partly overlain by a modern town of the same name. It stands amidst extensive fields made productive by colonial-period canals. Few wells have been found here but, like in Mohenjo-daro, buildings were raised on mud or brick platforms. A structure identified as a granary has two rows of rectangular halls, their floors raised on parallel sleeper walls (see Chapter 6). A number of round brick platforms constructed of four concentric circles of bricks laid on their long sides, each platform about 3.5 metres in diameter with hollow centres, were used for pounding grain, according to Mortimer Wheeler, but current excavators do not agree. Over 200 pottery urns were partially buried, upright, along the sides of some of the streets, to take town refuse like broken tools, ash, charcoal, potsherds and occasional pieces of slag or seeds. Street drains



The site of Harappa

were also laid. In this section of the town two rows of two-roomed self-contained units were said to be the residences of the poorest people or slaves, but a collection of jewellery with 240 gold beads, several gold bangles and hair ornaments, and other items was found buried under the floor of one of these units. Three small one-room mud huts in the same section of the city may better qualify as residences of the poor.

After the first excavations of the 1920s, published by M.S. Vats, it was Mortimer Wheeler who made a major excavation at Harappa, exposing a large vertical section across the edge of the citadel mound to reveal early construction activity, and also plotting a perimeter wall around the citadel. This wall was for defence, according to Wheeler. Amongst Wheeler's discoveries was a cart-track in the southern cemetery area with some six wheel-ruts still visible.

American-Pakistani excavations since 1986 at the Harappan site have revealed not only Kot Dijian levels at the base of the citadel mound (the Kot Dijian was a pre-urban culture of the Indus plains) but also painted pottery of an even earlier culture. Evidence of craft production is also coming up. Now attention is being paid not to excavating large areas of Harappa but to detailed exploration of matters

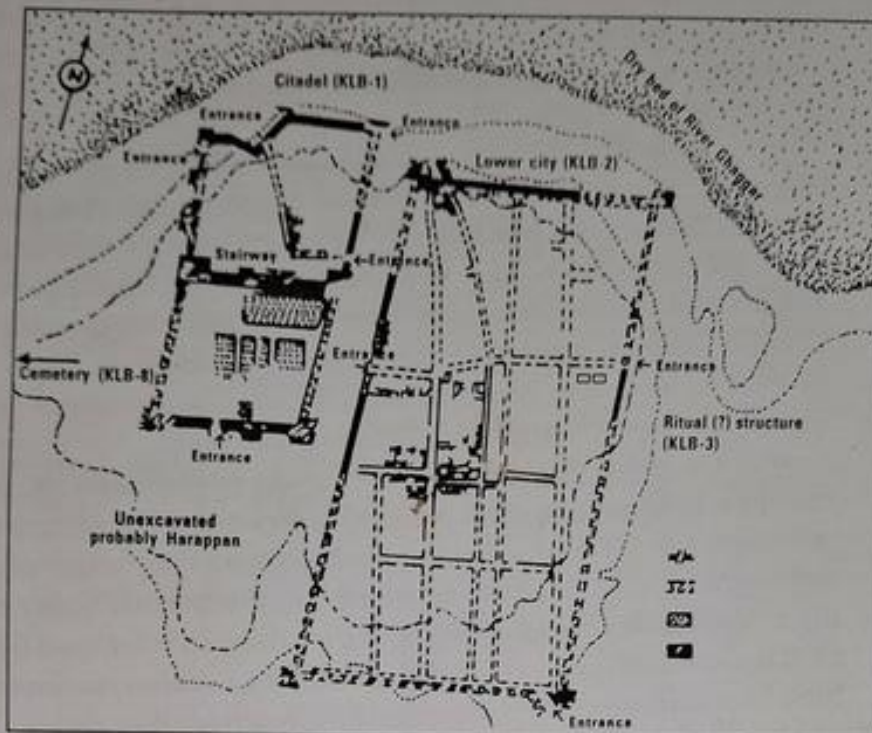
like the role of local river fish in the diet, the stratigraphic context of artefacts with writing, how the 'stoneware' bangles were made and the diverse wood charcoals used. The sequence of occupation at the site, we have seen, has been established on stratigraphic principles. From base to top there are: the 'Ravi' culture occupation; a Kot Dijian level with mud-brick (unbaked brick) construction; three levels of baked-brick buildings of the Mature Harappan period; a transitional phase; and a post-urban period in which a new culture is evidenced in Cemetery 'H'.

Cemetery 'H' lies on the southern edge of the site but the Mature Harappan or 'R' Cemetery lies even further south. The death ritual as evident in the latter involved burial of dead individuals singly, in graves that were long pits dug into the ground. In the large number of Harappan-period graves that have been excavated in R 37 bodies were mostly laid on one side, and an average of fifteen to twenty pots contained provisions for the afterlife. Stone and bronze ornaments adorned the person but never in profusion. A significant number of graves contained bronze mirrors. A few graves contained wooden coffins and/or reed shrouds, which was a Mesopotamian practice.

Not far upstream from the Pakistan-India border, on the lower Ghaggar/Sarasvati, that is, in the Sutlej-Jumna divide, lies the famous site of Kalibangan (twelve hectares), and further upstream, in present-day Haryana, lie Banawali (sixteen hectares), Rakhi Garhi (twenty-four hectares) and Mitathal (seven hectares).

Kalibangan, so named because of the countless sherds of dark terracotta bangles strewn on the surface of its two mounds, is on the left bank of the Ghaggar. An early habitation with an encircling wall lies beneath the Harappan-period citadel, also fortified. East of this lies a Harappan-period residential mound, directly on the plain and also enclosed by a wall of bricks. Here the residences of the inhabitants are built of mud brick and not baked brick as at Harappa, Mohenjo-daro and Chanhudaro, and it is not easy to say why. An occasional tiled house floor has been found. The lower town is laid on a grid of streets that do not run parallel to the city walls.

The citadel is divided by a wall into a northern residential sector and a southern portion with seemingly ritual facilities such as platforms, brick drains and fire altars (hollows containing ash and

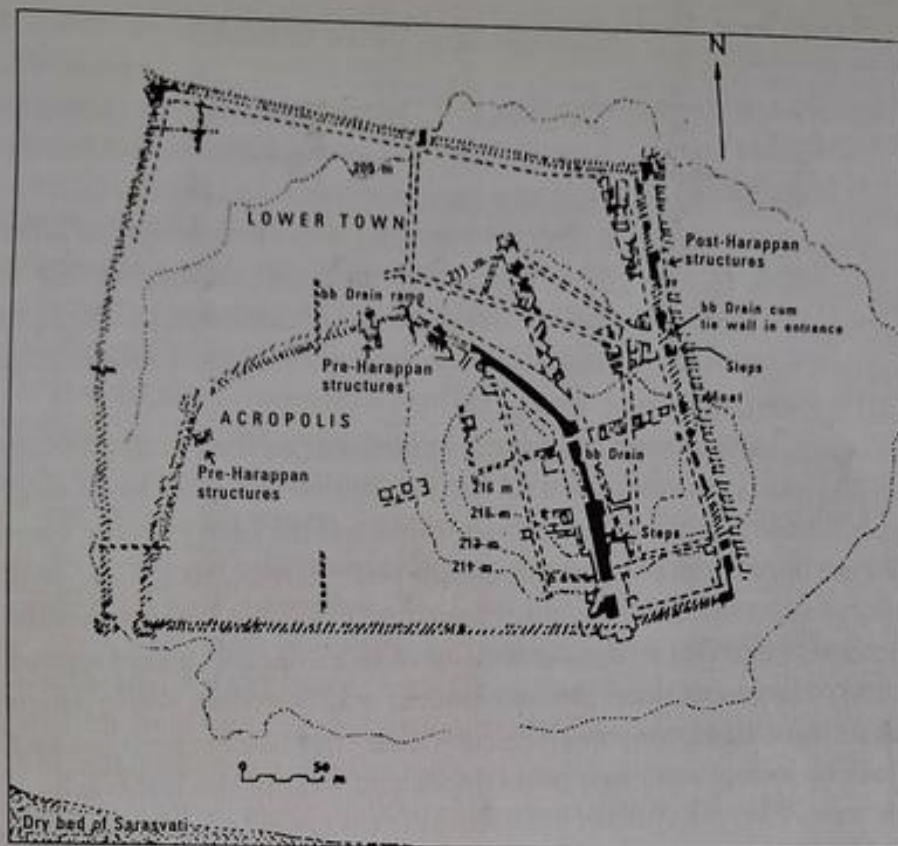


Kalibangan: Harappan period

burnt material, in the centres of which stand clay columns).

Beyond the two walled-in sectors lie a cemetery and a solitary ritual structure with fire altars. In the cemetery, skeletons lie with pottery and a few personal ornaments in individual graves, and there are also urns and pits containing grave-goods but no skeletons. In the northern part of the cemetery burials are in pots placed in round pits, while to the south are found ordinary rectangular pit graves. Interspersed amongst these are traces of what we might call 'symbolic burials', rectangular/oval pits with presumably funerary pottery offerings but no corporeal remains.

Other important finds at Kalibangan include an inscription scratched on a pot with one sign cutting another in such a way that it is clear that the writing is from right to left. Of great significance is the discovery of the surface of a field ploughed in two sets of furrows at right angles to each other. The field lies outside (southwest of) the town wall. Traced across an area of about 140 metres square, it lies under a layer of silt that in its turn was covered by strata with Harappan material. This is clear evidence that the

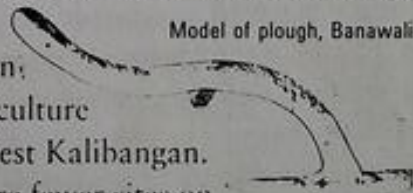


Banawali: site plan

plough was in use before the Mature Harappan period.

Northeast (upstream) from Kalibangan, we come to other important excavated sites. Rakhi Garhi is exceptionally large and recent excavations here have uncovered a large number of terracotta figurines of animals. The unique plan of Banawali includes a citadel incorporated within the city and not spatially separate, the whole encircled by a perimeter wall. A deep and wide moat was discovered ringing the perimeter wall. There are numerous seals, weights and pieces of stone jewellery. The seals are exceptional in the sense that those with the unicorn symbol do not predominate numerically, as at other Harappan sites. Significant with regard to agricultural technology is the terracotta model of a plough with a narrow share. The occupation of Banawali began with a material culture that was very similar to that of lowest Kalibangan.

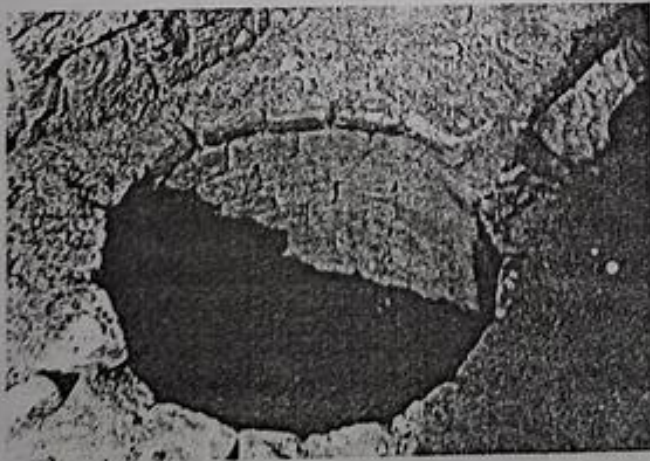
In Sind we find that there are fewer sites on



Model of plough, Banawali

the eastern plain than west of the river. Not that the western plain is crowded with villages even today— in marked contrast to the riverine tracts in the middle Gangetic system. It appears that the main flood discharge of the Indus spilled out on the west bank and that low-lying tracts around Larkhana and Dadu were filled with flood waters that remained there in the winter season. Such tracts were of key importance for agriculture, for here too annual precipitation does not exceed twenty centimetres on average. Larkhana was one of the richest agricultural provinces of the Indus plains and it is not surprising that the 120–150-hectare site of Mohenjo-daro lies in this district, at what is today a safe distance from the banks of the huge Indus channel. On a clear evening the crest of the Kirthars is visible from the citadel of Mohenjo-daro, and reference to Map 1 will reveal that the city was accessible from the Bolan Pass, a major route linking the fertile plains with Baluchistan and southern Afghanistan and Seistan, and one that had been active for centuries before the urbanization of Mohenjo-daro.

Unfortunately, the lowest levels of the settlement at Mohenjo-daro cannot be excavated as they are now submerged in subsoil water. Marshall and Mackay divided the building levels into nine phases and three periods—'Early', 'Middle' and 'Late'. We will be referring repeatedly to Mohenjo-daro below. Suffice it to state here that it is the most extensively excavated Harappan site and its excavated buildings are still so well preserved that the ruins are awe-inspiring. Some 300 houses/structures of various phases of the Harappan period and about 70 wells have been uncovered at the site. There



A Mohenjo-daro well, view from above. Note its proximity to a wall that was built later.

are very few protohistoric sites in South Asia that have seen sustained excavation to this degree. The site has produced the widest range of shells, stones and metals. It is at Mohenjo-daro that important pieces of Harappan sculpture, such as the bronze 'Dancing Girl', stone busts portraying men (including the 'Priest King') and monumental stone representations of animals on pedestals, have been found. And it is here that the greatest variety of seal motifs depicting animals and aspects of religious thought/life occurred. Notable also is the prolific use of faience, ivory and shell in domestic life.

Lake Manchhar, to the west of the lower Indus, is a depression that receives flood overspills from many directions: the Indus in the east, flood waters from the north, and minor rivers from the hills to the west and south. The lake expands greatly in the summer months to cover a large area and then shrinks in the dry weather, leaving some 8000 hectares of fertile soil moistened and ready for the *rabi* sowing, according to an early twentieth-century report. It is reasonable to infer that this micro-region was under *rabi* crops in Harappan times. There are a couple of third-millennium sites that are often submerged when the lake expands. Fishing on the lake and hunting around its margins were probably as important as agriculture in this region.

Many seemingly insignificant streams in the now barren hills (Kohistan) of western Sind and in the higher Kirthars are of value to human communities because they originate in the underground springs that abound in the fractured limestones and well up in the fissures, and are therefore perennial. These streams, like the Gaj or Kolachi, Angai and Naing, provide dependable—though limited—quantities of water and arable soil for farming. A few small Harappan sites are situated in this area.

Small sites like Amiliano and Allahdino, northeast of Karachi on the Mol-Malir river, lie on a rich aquifer that supplies modern Karachi, even as the river itself is seasonal. If we go further west we come to Balakot which lies on the ancient shoreline of the Las Bela plain. In Harappan times—but not during its earlier history—there was intensive utilization of sea-shells: shankh, and also a bivalve shell, were used for manufacture of bangles. The Balakot settlement was constructed largely of mud brick. A few seals and chert blades,

a profusion of terracotta cakes, and some metal objects are among the finds. There was contact with the neighbouring Kulli culture of southern Baluchistan (see Chapter 3).

To the east of the Indus, in southern Sind, lie Garho Bhiri and Kot Kori, two small sites which testify to the importance in Harappan times of the Eastern Nara branch of the Indus, and perhaps to a land route along it from Sind to the creeks on the northern edge of the Rann of Kutch.

Stone resources of great importance to the Harappan economy occur in northern Sind. A forty-kilometre-long limestone ridge extends north to south between the Indus and the Eastern Nara. Near the western edge of these limestone and chert-bearing hills, with dozens of stone-age and Harappan-period stone-flaking sites, lies the mound of Kot Diji where the remains of an earlier culture are topped by a conflagration level (broken objects, ash, charcoal), above which lie strata with Harappan artefacts. Other sites like Pir Surhayo and Dubi lie in this area, east of the Indus and west of the Rohri hills.

Where the hills of Kohistan abut the lower Indus lies another site bearing testimony to the 'transition' between the pre-urban and Harappan periods. This is Amri. Here, as at Kot Diji, there is an intermediate layer with earlier as well as Harappan-period pottery, but no destruction level. The inhabitants of this settlement could have taken advantage of the ecotone between two contrasting environments, the hills and the flood plain. On the other side (fifteen to twenty kilometres east) of the Indus river lies Chanhudaro, excavated in the 1930s and found to have architecture and street drains like those of Mohenjo-daro. Diverse craft items were made here: stone weights, seals, shell bangles and ladles, and steatite and carnelian beads. Exotic stones like fuschite, rare at Harappan sites, crystal, onyx and amethyst may have been brought here from long distances.

On the Kacchi plain, west of the Indus alluvium, is the site of Nausharo with a sequence from the later Early Harappan stage to two phases of the Mature Harappan (with eight metres of deposit in one section), and then a level with post-Harappan remains. To date, Nausharo has not yielded major evidence of craftwork. Instead, of interest are evidence of a possible water-storage tank with a baked-brick spillway and a few drains. But the excavators have noted that

drains do not occur in the same profusion and regularity as at Mohenjo-daro.

Within the great depression of the Rann of Kutch, water stands for about four months during the monsoon season. In the dry months the Rann is a vast, empty and incredibly silent stretch of mud. In the third millennium, probably because the discharge of the Luni river was greater then than today and because the Eastern Nara was a large stream, the mud flats of the Rann probably stood under water all the year round, and the water was probably sweeter. That is to say, in ancient times the water was of fluvial (river) as well as marine (sea) origin. So also, the underground aquifer in this arid zone (rainfall is less than forty centimetres) at that time must have held sweet water. Note that Kutch has no perennial river, and today its subsoil water is brackish. This region has about a dozen Harappan sites, most of them small fortified stations, Dholavira providing a striking exception.

Four high sandstone outcrops stand in the Great Rann of which one, Khadir Island, with Dholavira, has several sweet-water wells. It must have been subsoil water and the damming of small rivulets that made cultivation possible on this island to support the large population (say, 5000–10,000) of fifty-hectare Dholavira. A detailed map of Khadir Island, dating to the beginning of the twentieth century and marking all the villages and their populations, reveals that the total population of the entire island in about AD 1900 was lower than the estimated Harappan population of Dholavira alone! The hinterland that fed this population thus remains a mystery. Another geographic feature is that until partition, Kutch was linguistically and culturally **as close, if not closer, to Sind as it was to Kathiawad.**

Several mounds comprise the imposing site of Dholavira. The town walls are built of stone and brick, and enclose houses as well as open areas with water reservoirs made by ponding the local rivulets. There is typical Harappan pottery as well as material that is non-Harappan. Crafts include shell and bead-cutting. Publication of the details of the results of excavation is awaited.

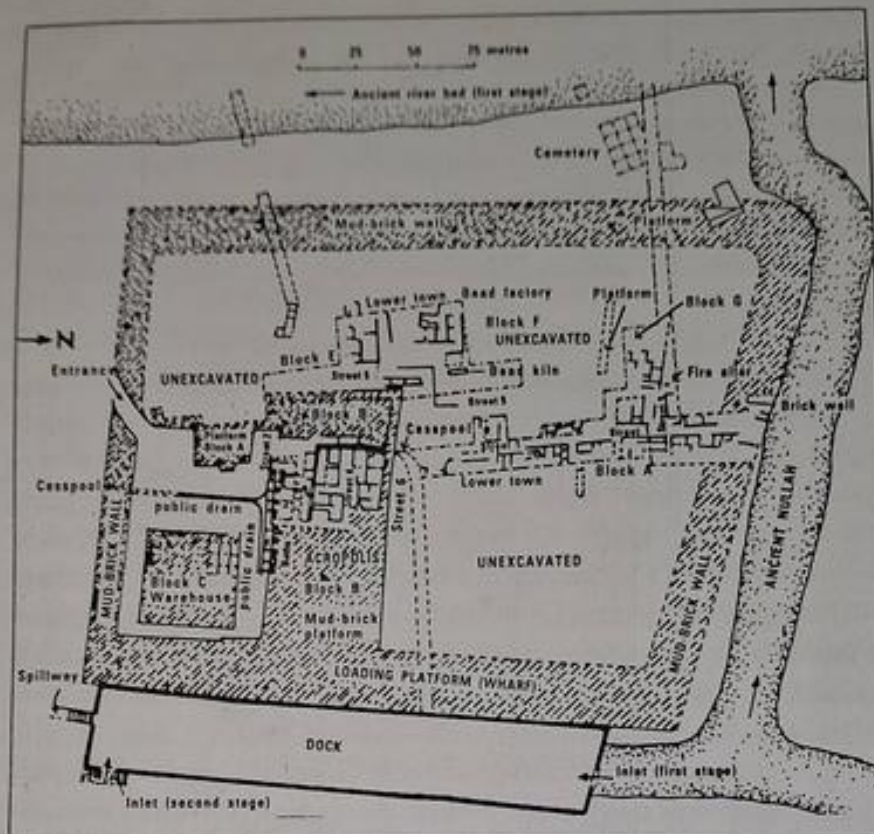
We will consider the nature of the much smaller settlement of Surkotada, on the western margins of the Little Rann, in a later chapter. Suffice it to note here that the environment is sparsely vegetated sandstone; Surkotada is not surrounded by modern cultivated

fields as is Lothal. Near the site is a *nala* that flows into the Little Rann, a water course that is seasonal today but may have been perennial in the third millennium. Bones of the onager, nilgai and antelope have been found at the site, and special amongst the botanical remains are seeds of setaria or foxtail millet, and ragi or finger millet. For Soundararajan, this is a Harappan fortress rather than a regular crop-raising village. What is of interest is that no special or abundant weaponry has been found; it is the cleverly planned entrance (see Chapter 6) into the enclosed settlement that speaks loudest of military defences.

In Kathiawad, Harappan settlements do not lie in the best agricultural tracts (those with black soil) but near the eastern margins of the peninsula, in a low tract (the Nal depression) with 60–65 centimetres of rainfall. In the early eighteenth century and perhaps also in protohistoric times, water collected in this depression during the winter months, making lift irrigation possible for the cultivation of winter wheat and pulses. To the west of Lothal stretches of land are waterlogged for several months in the year. This is the only zone of Kathiawad where winter crops like wheat are grown in appreciable quantity today. The best-known Harappan settlements in this zone are Lothal and Rangpur.

About six kilometres northwest of Dhanduka stands Rangpur, on the northwest bank of the Bhadar river which flows into the Gulf of Khambhat. Below the Harappan stratum but separated from it by an interregnum or hiatus (a break in occupation), is a level with remains of hunter-gatherers of the late stone age. Harappan Rangpur is characterized by street drains, Rohri chert blades, miniature steatite beads, weights, pottery and other Harappan artefacts, as well as red pottery made in a local tradition with a large proportion of mica particles incorporated in the clay. Above this Harappan stratum lies a layer with different architecture (there are no bricks or drains), and the pottery and small finds also show change. Subsequently there is evidence at Rangpur of the cultivation of bajra.

The excavation of Lothal by S.R. Rao provoked much discussion in the 1960s, mainly over the function of a structure that Rao said was a dockyard. Excavation here was fairly extensive and revealed, besides the dock, residential structures, a kind of citadel with



Lothal

a street drain serving a row of small adjacent houses, and a unit consisting of rows of mud-brick platforms separated by narrow aisles as in the 'granary' in the citadel of Mohenjo-daro, which Rao interpreted as a warehouse. About 69 burned clay sealings bearing impressions of string, knots, matting or fabric on one side, and stamped with seals on the other, came from the Lothal warehouse—the building suffered an accidental fire in antiquity—and are of great interest. Twelve of them were struck by the same seal; the seals used for stamping the stored parcels of cloth or matting were perhaps not local seals because none of the steatite seals found in Lothal match the impressions on the sealings in the warehouse. This indicates that goods came into the town from elsewhere, marking Lothal as a transit station, perhaps for overseas trade. This idea gains credence because a seal of the type made and used in contemporary Bahrain and Kuwait was found on

the surface of the Lothal mound.⁵ Craftwork included the production of metalware, beads and shell bangles. There is a cemetery at Lothal, badly disturbed in later periods, the dead interred in graves with pottery and a few ornaments and joints of meat (animal bones).

Before the Harappan township came into existence there lived here or in the vicinity inhabitants who made a micaceous red pottery of a non-Harappan (Indus region) sort. In the last occupation phase of Lothal, period 'B', the dockyard became non-functional and the architecture was reduced, as at Rangpur, to post-and-mud huts; also, few crafts survived.

The structure that Rao interpreted as a dockyard at Lothal is a trapezoid baked-brick basin roughly 2.5 metres deep, to the east of the mound, its longest side measuring about 218 metres. It was apparently fed by channels from the Gulf of Khambhat. Those who dispute the dockyard theory have problems with the alignment of the inlet channel(s) and question why a port at this location would have required a mooring basin, enclosed on four sides, for boats. The alternative suggestion, that this basin was a storage tank for water, is not more convincing than the 'dockyard' interpretation. We cannot discuss all the arguments here but what is important is that the Gulf of Khambhat is known for its tidal magnitude, about ten metres (in contrast to four metres at the Indus mouth or three at Chahbahar in Makran, and less than three at Porbandar in Kathiawad). The height of the water at high tide is immense; waters pile up and rush into the narrow gulf to reach within a short distance of Lothal; this facilitates the entry of boats, though at considerable risk. Incidentally, teak charcoal has been identified at Lothal. Its relevance at this juncture is that teak (once available not far from Ahmedabad) is an exceptionally useful wood for ship-building; among its various qualities is its durability in sea water.

In contrast to Lothal, which is about ten hectares in area, Nageswar is a small (less than two hectares) and disturbed site. It lies in northwestern Saurashtra, about seventeen kilometres northeast of Dwarka. Here too a natural depression near the settlement holds fresh water. But the soils are not particularly good for crops. At Nageswar, unlike Rangpur and Lothal, the Kathiawadi micaceous red pottery is

⁵ At Bet Dwarka too Rao reported the find of a seal of the Gulf type.

absent except for a single sherd. The extant mound is littered with thousands of pieces of shankh-shell (more than in all of Mohenjodaro) and pieces of the *Chicoreus ramosus* gastropod. Bangles were cut from shankh, and from the *Chicoreus*, ladles. The shallow bays off the coast to the north of the site are rich in these shells. With very many more unfinished than finished bangles here, there can be no doubt that Nageswar was a shell-working station.

The small site of Kuntasi, about two hectares in area, is situated thirty-two kilometres west of Morvi and about four kilometres from the shore of the inner corner of the Gulf of Kutch. Here too, the soils are poor. Furthermore, although the settlement sits on the bank of a small river, there is no reported depression holding rain water, and the local wells are said to be brackish. The excavator, M.K. Dhavalikar, makes a case for this Harappan site having had a manufacturing and trade function, probably on the basis of the occurrence of cubical chert weights, long and slender carnelian beads, and large quantities of steatite micro-beads. But he does not catalogue tools of manufacture (say, stone or bronze drills) or craft workshop fixtures such as anvils or hones. No unfinished beads are catalogued in the site report either. The mineral resources of the area, in any case, seem to comprise fine clays rather than semi-precious stones. There is no inscribed artefact and no regular Harappan steatite seal, nor sealed jars or storage facilities, to give the settlement a strong association with trade.

Let us complete the survey of the Harappan map with attention to some sites lying at a distance from this zone. On the Makran coast of Pakistan, near the border with Iran, is Sutkagen-dor, with Sotka-koh and the small fishing settlement of Prahag further east. Both are settlements of relatively small size but with substantial stone fortifications and guarded gateways. The Makran is an unattractive region, hot, arid, and with torrential rivers and little cultivable soil. Date-palms and fishing are its main resources. As is the case in any arid zone, the rain falls in torrents. When rains lashed the region for thirty-eight continuous hours in March 1998, they left 1500 dead. Flash floods carry away bridges, roads and people. It is said that because of its torrential nature, 95 per cent of the rain that falls in Makran goes to waste.

There are two other interesting aspects to the Harappan

settlements in Makran. The first relates to the seas. Monsoon weather at Sutkagen-dor does not bring the raging storms, strong winds and dangerous currents that we find on the west coast of India. On sailing westward from India, Gwadar (a medieval-period port near Sutkagen-dor) is the first coastal place we reach where boats do not have to stay moored in the harbour in July and August. This, together with what we know about Harappan trade connections with Mesopotamia and the Gulf, imparts a particular significance to the location of Harappan Sutkagen-dor. Second, Gwadar has an interesting history. In recent centuries it was held by the rulers of Muscat and on occasion a coup would be staged in Muscat by a rebel prince sailing out with his militia from Gwadar. This means that the Gwadar-Muscat sailing is relatively easy and short for premodern vessels. According to one informant, the run can be made in eighteen hours by modern motor-boat or thirty to forty hours in a sailing vessel. When it was found that Harappan artefacts occur near Muscat and further inland in the copper-bearing Oman peninsula, Sutkagen-dor took on even further significance.

Further inland in Makran, near Turbat, lie Shahi Tump and Miri Qalat, with the remains of a local culture plus Harappan artefacts. (In contrast, Sutkagen-dor and Sotka-koh have exclusively Harappan assemblages, with only a few sherds of local pottery.) Miri Qalat is important as its occupation dates to a very early period, say 4500 BC, and around/before 3000 BC it appears to have been part of the cultural world of southeast Iran and Afghanistan.



The deodar (Himalayan cedar)

While the Indus is navigable downstream of Attock, the Chenab is navigable from Akhnoor near Jammu, and the Sutlej from Ropar. We find Harappan sites near two navigation heads, Manda of the Chenab, and Ropar and Kotla Nihang Khan of the Sutlej. This points to the importance of river transportation, and this in turn suggests that upland resources, probably wood and metals, were procured. Logs of deodar, used for ceiling beams at

Mohenjo-daro, were until recently floated down the Ravi river to Lahore. Not far upstream from Ropar and Kotla Nihang Khan on the upper Sutlej stands valuable Shivalik forest, with chir pine, sal, ebony, shisham and, at higher altitudes, deodar. Nineteenth-century reports mention gold-panning in the beds of some mountain torrents in this area. At some time in the past copper was mined near Kulu and near Shimla, and also in the lower hills.

Ropar, on the upper Sutlej navigation head, is particularly favourably located for access to multiple resources. Rainfall is good, 65–70 centimetres a year; the Sutlej is narrow at this juncture and can be crossed; the soils are fertile. The Sutlej crossing lies on the trunk route linking the northwestern mountain frontier (Afghanistan) of South Asia with the northern Indian plains. Not surprisingly, the site of Ropar was occupied not only in the Harappan period but also (after an interregnum) in the iron, early historic and medieval ages. Two kilometres southeast lies Kotla Nihang Khan, and a little northeast, Dher Majra. These two are sites of the Bara culture of prehistoric Punjab, showing different degrees of Harappan influence. (Some Bara pottery occurs at Ropar.)

Harappan Manda, near Akhnoor and on the right bank of the Chenab northwest of Jammu, is overlain by very rich Kushana-period material. In the earliest stratum Kot Dijian-like pottery occurs along with Harappan ware. We will see below that the valley of Kashmir is not irrelevant to the Harappan civilization, so that sites like Manda, whose location attests to links with the northern and northwestern frontiers of South Asia, although put to limited excavations, are fairly important.

The settlement farthest from the Harappan heartland is Shortughai, on dry steppe, twenty-one kilometres upstream of the confluence of the Kokcha with the Oxus. Annual rainfall here is about twenty-five centimetres. The upper course of the Kokcha flows in steep ravines where lapis lazuli is quarried in the winter. In recent times gold was panned from its sands, and there are also reports of alluvial tin in the sands of the Kokcha. Shortughai is Harappan in its pottery and brick structures, its flat round gold beads with axial tubes, carnelian beads, bronze mirror and shank-shell bangles. Local features include the cultivation of *Panicum miliaceum*, the common millet native to Central Asia; clear evidence of an irrigation

canal carrying water from the Kokcha to the prehistoric village; and a terracotta figure of probably a camel. That Shortughai was a Harappan colony is indicated by the fact that there are Harappan artefacts in the lowest levels and that lapis-lazuli cutting is also attested in the very first level of occupation.



Terracotta camel figure
from Shortughai

Thus far we have seen that some of the Harappan sites, like Mohenjo-daro, lie in highly productive, wheat-growing regions, while others like Sutkagen-dor are ports; Balakot and Nageswar are marine shell-processing centres. Ropar took advantage of a fertile pocket on key land and water transportation nodes, and Shortughai played a role in the procurement of precious/scarce stone and metals.

The natural world of the Harappans, as indicated by seeds and bones and by figurative art, features flora as diverse as bamboo, shisham and pipal, teak and date-palm. Pipal-wood charcoal has not been identified in Harappan archaeological remains even though the pipal leaf is a common motif painted on pottery. One possible reason is that the pipal tree was sacred, as it is today, and therefore not cut down for utilitarian needs. While the Himalayan deodar was utilized at Mohenjo-daro, at Kalibangan there was teak which could not have grown locally. Similarly, it is likely that the bamboo, identified at Harappa, is not indigenous to the greater Indus valley. There were peacocks and domestic fowl. The hare, squirrel and hedgehog, as well as the crocodile, are portrayed in clay or faience, on copper tablets or on stone seals. Deer are painted on jars.



Pipal leaf (and other designs), painted on a Harappan pot



Model of a bull, Prince of Wales Museum of Western India (PoWM)

Other than village herds of cattle, sheep and goat, there were animals who left their footprints on bricks: cats, dogs, monkeys. A camel skeleton was found in Mohenjodaro, elephant bones in the moat around Banawali, and rhinoceros bones at Nausharo. Wild animals depicted on the seals include the antelope, elephant, tiger and rhinoceros.

The locations of Harappan sites are not totally explained by climatic conditions. In fact rainfall, as in all arid regions of the world, is erratic—variability in Sind, for example, is 65 per cent. In ancient economies the aim was to minimize risk rather than to calculate the relative costs of input and output, for land and labour were not commodities that were bought and sold—much less so seed, fodder or natural fertilizer. Hence people chose to settle in areas with reliable resources—i.e. those annually inundated or, more important, with perennial springs or lakes or sweet-water wells close to the surface—rather than in areas with high but unreliable rainfall. Ground and surface water sources imply the importance of lifting water from wells or from standing pools, into ditches or conduits. At wells, oxen must have worked at pulleys or levers to haul water, necessitating a great deal of human labour and animal power. Early in this century there were several wells in the countryside around Harappa, about a third of the irrigated land being watered by them. People built huts near them to store food, tools and hay for their oxen, and each well became a little village as man and beast worked continuously at the well from about December to the March–April harvest. This in turn means that however much land was available, Harappan agricultural output must have been constrained by the availability of human labour and animal power. It was not as easy to bring new land under cultivation here as it was in contemporary Mesopotamia. It is truly a paradox that the plains of the mighty Indus did not offer potential for unlimited agricultural growth.

Other than farming, subsistence would have incorporated river fish and game, and the breeding of not only good milch cattle but also strong working oxen would have been important. Substantial populations of working cattle mean large herds, of which at least those put to work must have been able to graze in proximity to the



Fisherman with nets (?), painted on a Harappan pot

villages or fields. Also, there were probably herds of sheep and goat all over the region. Livestock provide manure for fields, and in many contexts in India the critical difference between agricultural success and failure has been decided by the availability of sheep or cattle manure.

Mobile pastoralism (which involves subsisting on the produce of animal herds that are moved over the seasons from one grazing area to another) is also a possibility in the Harappan period. Some groups could have moved, for part of the year (in winter) if not all the year through, with herds of cattle or sheep and goat, from the high Kirthar slopes to the plains of the Indus. Other movements could have been across the Hakra plain into Haryana, and yet others between Sind and Kutch. In general, at Harappan sites the bones of cattle outnumber those of sheep/goat. This tells us that more cattle were slaughtered (or died natural deaths) at habitation sites than the smaller animals. Normally, the pattern is the reverse. It is observed that people who keep both sheep/goat and cattle prefer to slaughter the former for meat as they are smaller (the 'small change' of livestock capital) and breed more rapidly. Thus it is usually expected that even if numerous cattle are bred and tended, they will be under-represented in the archaeological record, while sheep/goat bones will be numerically dominant. Noteworthy is the fact that the third-millennium sites, by yielding the reverse numerical proportions, indicate a particular preference for cattle.

We have seen that there was a diversity of subsistence resources and activities in the Harappan period, and that where agriculture is concerned, ground and subsoil water were of prime importance. The question that comes to mind is whether the population at large

was adequately nourished over the centuries. Scientific studies of the teeth, skulls and long bones of ancient populations can indicate some kinds of 'pathological' conditions. While there appears to be a fairly low incidence of dental caries (tooth cavities) and tooth loss in adulthood amongst the Harappan population, tooth enamel 'hypoplasia' or interrupted growth of the crown of the tooth reveals probable nutritional stress (inadequate food intake) in several individuals. Like other prehistoric South Asian populations, many Harappans had thickening of the cranial vault bones with lesions on these bones, or 'porotic hyperostosis', that can be caused by either iron deficiency due to malnutrition or intestinal parasites or the malarial parasite. Physical anthropologists who have studied skeletons from Harappan sites over the last few decades have come to suspect malaria as the major cause of this pathological condition of skulls. This in turn implies that there were conditions like stretches of stagnant water that were conducive to the breeding of the mosquito.

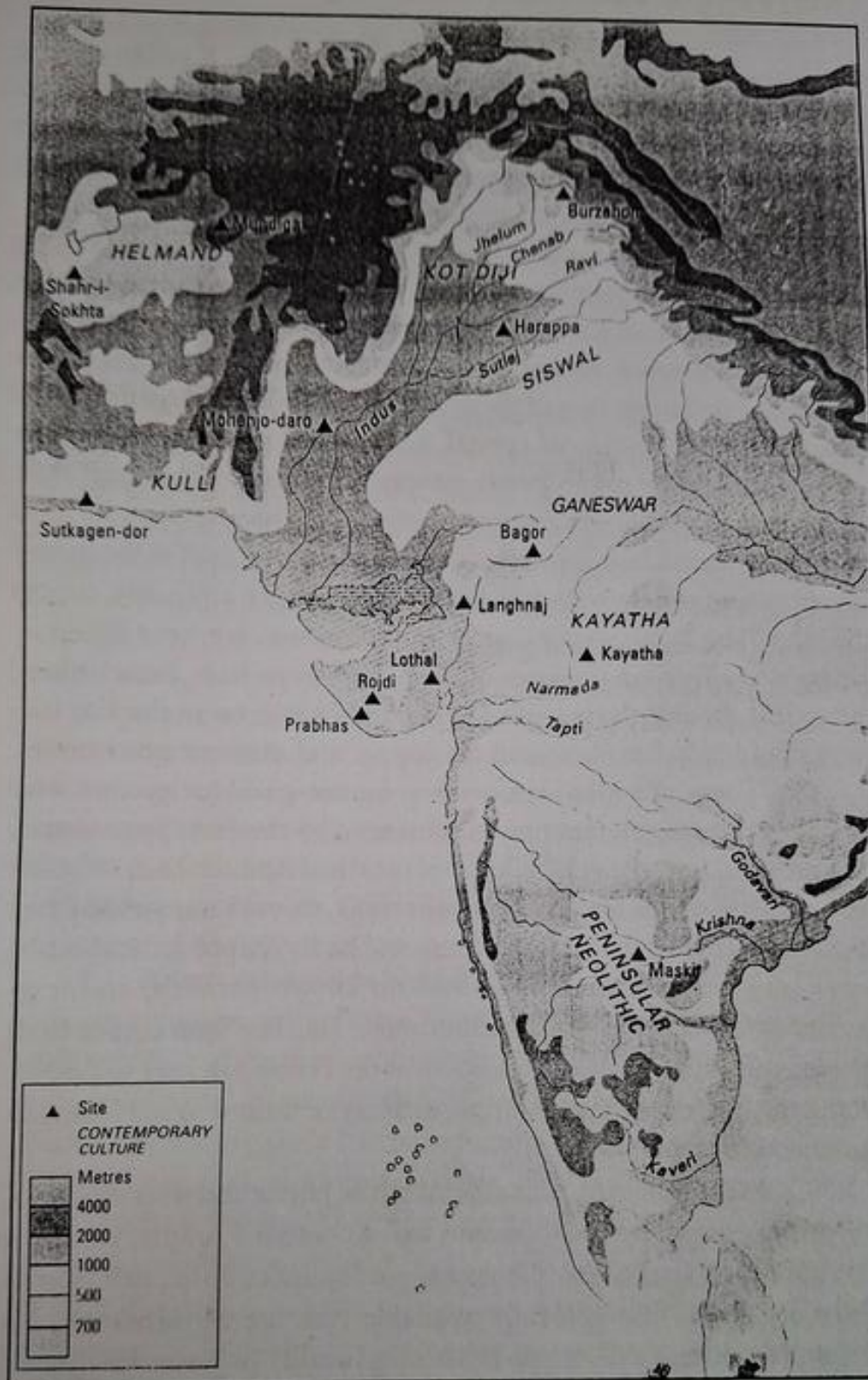
Neighbours and Trade Partners

This chapter outlines the world within which the Harappan civilization flourished (Maps 3 and 4). Who were the other peoples/groups/cultures in the neighbourhood at the time?

Within the Harappan area as delineated in Chapter 2, on the Ghaggar (Sarasvati) system upstream of Sirsa, we find a local culture that we may call Sothi-Siswal. It survived as a contemporary of the Harappan, as one of the 'folk traditions' subsumed within the Harappan great tradition. There are major Harappan settlements here, as we have seen: Kalibangan, Mitathal, Banawali, Rakhi Garhi. There are also a large number of sites—165, according to Possehl—representing only the Sothi-Siswal material culture with characteristic pottery, querns (large and reasonably flat, coarse-grained stones for grinding grain), deep clay-lined bins for storage and clay multiple (joined) bangles. Some of the Sothi sites have yielded a few artefacts showing Harappan contact.

A few years ago the small village site of Kunal, north of Hissar, attracted public attention. It appears to exhibit a local culture with its own house forms, bone tools and pottery, and also stray Harappan pottery and a treasure of gold-leaf and silver ornaments, plus thousands of small beads of lapis lazuli, carnelian and shell, all found in one earthen pot. As the Harappan finds are not distributed across the different houses of the site, we cannot interpret Kunal as a Harappan site. The cache or treasure could have been the gift of a visiting Harappan emissary to the local elder or chief, or perhaps booty from a successful raid carried out by the villagers.

Further upstream in the Ghaggar-Sarasvati plain lie the sites of the Bara culture which we have mentioned above. Unfortunately,



Map 3: Contemporary Cultures and Neighbours

not enough research has been done on this culture and its links with the Siswal and Harappa cultures; it was at least partly contemporaneous with the Harappan.

While the Sothi-Siswal province was ultimately integrated into the Harappan world, not so the Kot Dijian area. 'Kot Diji' is the name given to another pre-urban culture, after the type-site of Kot Diji which lies on the left bank of the Indus some 55 kilometres east of Mohenjo-daro. Radiocarbon dates for materials from the Kot Dijian context indicate that this regional culture originated earlier and then continued as a contemporary of the Harappan. The northern Harappan frontier stretches from Mianwali towards Lahore and then Banawali, but Kot Dijian sites are known further north in the Bannu basin and near Taxila. A political frontier may well have developed between these two culture areas that blocked northward expansion of the Harappan system into areas with good soils and higher winter rainfall.

To the west of the Harappan world, in the arid mountain region of southern Baluchistan, was the contemporary 'Kulli' culture. Its architecture is of stone with stone flagging, with doorways sometimes placed in the corners of rooms, as if the people were uncertain about stone construction techniques. Dates, herds of sheep and goat, fishing, and limited farming would have afforded subsistence. Kulli pottery is characterized by well-made grey canisters, but at many Kulli sites, like Nindowari and Kulli, there is also Harappan or Harappan-influenced pottery, Harappan seals, weights and ornaments. The Kulli province would have been important because it lies across land routes to the Makran coastal stations that we have mentioned: it would have been in the Harappan interest to ensure peace and safe passage along these routes. Even as Harappan material occurs at Kulli sites, there was also a seemingly reverse movement: at Harappan Nausharo on the Bolan route on the western frontier of Sind, and at Balakot in southern Las Bela, there is pottery painted in the Kulli style.

Around Srinagar in the Jhelum valley lie some early food-producing (neolithic) villages like Burzahom and Gufkral, where residence began in pit houses that were scooped out of the soft *karewa* soil, the roof supported on wooden posts around the rim of the pit. The villagers kept herds of sheep, goat and cattle, and grew wheat, barley,

lentils and peas. In the later neolithic levels at Burzahom, when people lived in mud houses above ground level, along with the local grey and brown hand-made pottery, awls, needles and pins of polished bone, and ground stone axes, are two interesting finds. One is a pot with an orange-red surface and a painted motif representing the stylized and exaggeratedly curved horns of an animal, in the Kot Dijian style. At a higher level (thus later) was found a pot containing about 950 carnelian beads, both pot and beads clearly non-local in origin, and on display at the National Museum, Delhi. Here, as at Kunal, we are dealing with a cache. This and a few copper arrow-heads and fragments support the argument that this forested mountain valley was visited by the Harappans in search of mineral wealth. (We need also to consider the possibility that the domesticated plants and animals of the Kashmir village economy came from the Harappan area.)

It was inferred many years ago that local chalcolithic cultures in Saurashtra could have pre-dated the urban Harappan and then coexisted with it. Local ceramic elements include a vessel with a protruding 'stud' handle at the rim, the 'club' or square rim, and the use of clay with a large quantity of mica. At Padri, south of Bhavnagar, the pottery has Harappan affinities but there are no seals, weights or long carnelian beads. Houses are simple mud constructions or else with walls made of stone rubble. The seven-hectare settlement of Rojdi in central Saurashtra (near Rajkot) was on the whole contemporary with Harappan settlements but the artefacts here are not all of the Harappan type. There are no seals or writing, crops include millets, and the pottery is not entirely Harappan. The pottery lacks the painting style and some of the characteristic shapes of Rangpur Harappan pottery, and includes coarse wares not produced in the Indus valley. To distinguish Rojdi from sites like Lothal, G.L. Possehl, the excavator of Rojdi, calls the latter 'Sorath Harappan' (the culture of Lothal and Rangpur being, in his terms, 'Sind Harappan'). It could alternatively be suggested that Rojdi was a village practising a local culture and having Harappan contact, as evidenced by sporadic weights, metal and etched carnelian beads. It has also been said that the material from Rojdi resembles that from post-Harappan Rangpur. Also inadequately explored is the possible relationship between the material at Rojdi and that excavated at

Prabhas Patan (Somnath) on the southern coast of Kathiawad. It is remarkable that several non-Harappan settlements of the period are known also on the Gujarat mainland, east of the margins of the Little Rann in particular, representing in their coarse and fine red ceramics one or more local culture traditions.

In Rajasthan and Malwa we find simple food-producing cultures utilizing stone tools, with some knowledge of copper. Among these is chalcolithic Kayatha, twenty-five kilometres east of Ujjain, with the occurrence, amongst local artefacts, of three caches in one and the same house: two of these are pots full of carnelian and agate beads with one or two of crystal, and a third pot contains a large number of steatite micro-beads, generally Harappan in appearance. This was a typical South Asian chalcolithic culture: a simple farming village with mud huts, pottery and flaked stone tools. Yet the people made exceptionally well-cast flat axes of copper and wore copper bangles. The local copper source is not known, but near Ujjain lie agate and carnelian quarries that are known to have been utilized after 200 BC, and the reasons for Harappan interest in the Kayatha area could have been a search for copper and semi-precious stones.

There are also one or two hunter-gatherer groups who appear to be neighbours not uninfluenced by the Harappan world. In north Gujarat, about 60 kilometres north of Ahmedabad, is the site of Langhnaj. Aside from flaked stone tools, this site has yielded very small sherds of crudely made pottery and badly shaped ground-stone axes, plus a long copper knife with no known parallels, and fragments and two beads of dentalium shell. This last item comes from the seas off Kathiawad and is known at the Harappan sites of Lothal, Rangpur, Nageswar and Harappa, and may be testimony to Harappan contact with Langhnaj.

In the northern Aravallis, north of Jaipur and west of Alwar, in terrain crossed by small streams that flow to the Jumna, we know of about forty sites of the 'Ganeswar-Jodhpura culture', rich in artefacts of copper that is locally available (the site of Ganeswar, for example, lies near the copper-producing locality of Neem-ka-thana). This was probably a rural culture with its own pottery traditions, a culture of 'metal-producing tribes' perhaps. At Bairat the Asokan edict which addresses the members of a local Buddhist monastery and the ruins of Buddhist structures indicate that in the early historic

period at least this zone had particular economic importance.

Last, we consider a hunter-gatherer location of extremely long duration, Bagor in the eastern Aravallis, on a sand-dune above a small tributary of the Banas river. In the second of its three periods occur, amongst stone tools and the bones of hunted animals, a copper/bronze awl, a spearhead and three arrowheads of Harappan shape but with perforations. The spearhead, with a thickening down the centre, is not of Harappan form. The copper items occurred in graves, as did a few carnelian beads. There was also pottery—non-Harappan—in the graves.

Village life was established in peninsular India in the third millennium. There was a widely distributed neolithic culture through northern Karnataka, with an economy based on cattle-rearing, hunting, gathering, and cultivation of millets (*ragi*) and horsegram. Some of the sites (Maski, Piklihal) are located in the close vicinity of a rich gold deposit, Hutti, in the Raichur doab, which was important enough in later times to merit the raising of an inscribed edict of emperor Asoka. Surface finds at Maski yielded, besides, a cylinder seal of a type known in Mesopotamia in the early third millennium BC. There was a small amethyst bead at neolithic-chalcolithic Maski: another important product of southern India. Amethyst occurs as lumps and beads at Mohenjo-daro and Chanhudaro. At Piklihal, on the other hand, occurs a bronze chisel of Harappan type. Harappan interests could have sporadically extended into northern Karnataka for the gold and precious stones that occur there and further south.

A last observation on the situation of the Harappan urban culture amongst various tribal farming and hunter-gatherer cultures of South Asia of the time: while we tend to find Harappan items at the villages of tribal cultures or the camps of the hunter-gatherers, other than Kulli pottery there has been no reporting of, say, Burzahom or Kayatha material, at Harappan sites. The explanation may be that artefacts from the neighbouring sites have gone unnoticed or unrecognized at the major city-site excavations. Or else, items crafted with skill at Harappan centres moved out to the technologically less-developed groups—in any exchange or encounter the Harappans would obviously have held the initiative. Moreover, it could have been the natural resources of their neighbours and contemporaries that the Harappans coveted, not their crafts or craft skills.



Map 4: Contemporary Bronze Age Civilizations west of the Indus

Let us now consider Harappan contacts with the contemporary Bronze Age cultures of western and Central Asia.

Before the urban period there were sites along what has been, through history, a major world route: the route from Kandahar (an important agricultural node of Afghanistan and itself a major node of land roads) via Chaman and the Khojak Pass to the Quetta valley, and continuing southeastward, through the Bolan Pass, to descend on the Kacchi plain on the frontier between Baluchistan and Sind. As we shall see below, it cannot be a coincidence that Mehrgarh, the first-known agricultural settlement of South Asia, is situated on the Kacchi plain and gives evidence of domestication of plants and animals that would have had their habitat in the Baluchistan or Afghanistan uplands, or further west. Later in its history, Mehrgarh shows connections with sites near Quetta and Kandahar. Mundigak near Kandahar, in turn, came to have a strong affinity with the settlement of Shahr-i Sokhta in Seistan, near the inland delta of the Helmand river which flows into Seistan from the region around Kandahar.

Near Kandahar we find one of the few large stretches of arable land in mountainous Afghanistan, 'the crossroads of Asia'. Sheep

and goat-herders move towards Kandahar in the winter from hills further south, east and north, and also up the Helmand river from the southwest. (Shahr-i Sokhta, incidentally, produced an exceptional number of cattle figurines.) The Seistan region has poplar, tamarisk and ash trees; the *hamun* or depression into which the Helmand empties, besides offering naturally irrigated soils on its margins, is also fringed by dense swamp vegetation which is good pasturage for cattle and is the habitat of marsh birds (more than forty species are represented in the bones at Shahr-i Sokhta). Here too the crops included wheat, barley and linseed, with grape and melon, and the livestock, cattle, sheep, goat and the two-humped Bactrian camel. By the early third millennium, the brick-built town of Shahr-i Sokhta grew to about 150 hectares.

Craft products included pottery, stone containers and beads of several kinds of stone, including turquoise and lapis lazuli. A quantity of debris from bead-cutting has been found in the residential areas and one or two graves at Shahr-i Sokhta have bead-makers' tool-kits interred with the dead. The most fascinating aspect of Shahr-i Sokhta is its location: it is accessible from Kandahar by a route down the Helmand used by pastoralists; it is connected with the Tedzen delta and Turkmenia in the north by a major natural highway with exceptionally good pastures. Earliest Shahr-i Sokhta shows cultural contact with Mundigak near Kandahar, with early Baluchistan, with Turkmenia and the Tedzen, and also with the plateau of southeast Iran.

Shahr-i Sokhta and Mundigak had links with Mehrgarh and the Quetta sites in the pre-Harappan period, but none later with the Mature Harappan sites. Conversely, there are no Harappan elements or influences in the Kandahar or Seistan regions. This could be an argument for the theory that the Harappan polity closely guarded its western mountain frontier.

A much greater distance away, across the high mountain region of Afghanistan, in Turkmenia, there was a somewhat parallel development of culture(s) from the neolithic to the Bronze Age. Villages were located along the northeastern piedmont (foothill zone) of the Kopet Dag range. The same cultigens (sheep, goat, cattle, wheat, barley) as in western and South Asia were involved in this region—it lies on a boundary between mountain and desert, with winter rainfall of about twenty-five centimetres a year. The major

urban settlement was Altyn-depe, with strong fortifications, a ceremonial parade entrance at one gateway, varied techniques of alloying metal, and distinct residential precincts for the elite and for the populace. Before the beginning of the Bronze Age the two-humped Bactrian camel was domesticated and was put to pulling four-wheeled vehicles and carrying loads. This is an immensely useful beast of burden in snow-covered regions and arid tracts. At Shahr-i Sokhta, in fact, the dung of a young camel has been identified. The animal had apparently been stall-fed, on straw. Camels had obviously been taken southward from Turkmenia along the pastoralist route to Seistan.

There are hints of interaction between the Indus valley and Turkmenia (Central Asia), the two civilizations being partly contemporary. These interactions may not have been through trade in the literal sense. At Harappan sites there are bronze pins with their heads in the form of superbly-fashioned animals, plus small bronze flagons with long necks (both of which artefact-types are on display at the National Museum, Delhi), that are very Central Asian. There is a seal at Harappa depicting a heraldic eagle, which again is a link with Central Asia. On the other side, at Altyn-depe, occur etched carnelian beads, ivory rods/batons, a silver amulet and two seals, all of which may have originated in the Harappan culture. One of the seals occurred in a sepulchre that was connected with the funerary rites of the elite. A large and beautifully etched carnelian bead came from a rich grave, as did a silver amulet in the form of a three-headed feline. These find-spots, the association with the dead, and the paucity of Harappan artefacts in Turkmenia may speak for their symbolism rather than any commodity value.¹

If we were to sail west in a Harappan ship, the first halt after Sutkagen-dor, as far as we know, would have been near Muscat, in copper-rich Oman. (Muscat is the best-placed harbour on the Oman coast as regards shelter for coastal shipping from the Red Sea and

¹ Material items of symbolic or cultural value are those with intrinsic meaning and worth endowed by the culture in question; their exchange is permeated by feelings of obligation or acknowledgment of status. In contrast, commodities are things with an exchange value and their exchange need not create any special bond, moral or social, between giver and receiver.

India.) Other than about a hundred localities producing copper, this arid land with its barren hills and date- and sorghum-cultivating oases, where it may not rain for five years, also yields a hard black stone (diorite, dolerite, gabbro) that takes a good polish and was used for making imposing statues of kings in Mesopotamia.

The prehistory of Oman is marked by the development of marine fishing in the early periods and then agriculture (mainly sorghum or pawat, probably introduced from the Yemen, further south). The early dependence on marine resources indicates that coastal sailing had an ancient history. In northern Oman, around the end of the fourth millennium BC, a fine painted pottery of Mesopotamian origin, dating roughly 3100–2900 BC, occurs in some graves. This has been interpreted as evidence for an early Mesopotamian copper quest. At coastal sites and in the wadis of the interior occur, centuries later, scattered remains of Harappan or Harappan-related artefacts: signs inscribed on distinctive jars, stray ivory combs, chert weights, and a few etched carnelian beads. It appears that Oman was thinly populated in the third millennium and Harappan expeditions to mine and smelt copper there or to collect smelted copper from local groups, and the odd Harappan shipwreck off the coast of Muscat, may explain these finds.

If we sail into the Gulf keeping to its northern shore until we are opposite the peninsula of Qatar, we can turn southwest to the Bahrain archipelago, also arid with rainfall less than ten centimetres. Here agriculture is made possible only by the peculiar geology of the main island: numerous fresh-water sources that spring to the surface, especially along the northern and western margins of the main island. The waters of the sea are extremely shallow off the coast of Bahrain and through the centuries men have dived to the sea-bed for pearls.

Perhaps it was the 'miracle' of sweet-water artesian wells, on land as well as off-shore, that gave 'Dilmun', as Bahrain (and also Failaka island off Kuwait) was called, a special place in Mesopotamian mythology. In the third millennium shrines were built at such springs. Vast prehistoric cemeteries also cover the main island of Bahrain. The Mesopotamian tablets also show that Dilmun, 'in the midst of the Lower Sea', produced dates and pearls and shipped ivory, gold, carnelian and lapis lazuli to Mesopotamia. Its population would have included seafarers, as Dilmun boats are mentioned in the inscriptions

of Mesopotamian kings and also depicted on a couple of Gulf seals.

As expected, in Bahrain we have evidence of Harappan artefacts like etched carnelian beads and ivory. Also, weighing procedures at this entrepot followed the Harappan weight system (fractions and multiples of 13.5 grams). This is testified by excavated stone weights as well as references in Mesopotamian texts to the *mana*, or unit of weight, of Dilmun. The seals of Dilmun/Bahrain, however, had their own forms and motifs and were not inscribed with writing.

From Dilmun/Bahrain one sailed to Mesopotamia via Failaka island off Kuwait (also sharing the culture of Bahrain). Mesopotamia was the richest agricultural land of the Bronze Age world, with the densest population. Not only was it blessed with high returns on the sown seed and high productivity per hectare of land, it has also been calculated that after 2500 BC there were truly vast herds of sheep and goat. Urban centres too were the largest of the period: Uruk in the extreme south was more than 400 hectares, and one or two other cities, 200 hectares each. This explains why Mesopotamia was a major participant in the trade of the world, the greatest consumer (as far as we can tell) of shell, lapis, gold, silver and carnelian. Harappan shells and etched carnelian beads are found in Mesopotamian royal burials. Several small monkey figurines occur in Mesopotamia, although the monkey is not native to western Asia. The animal, which some Harappans may have taken abroad with them as a pet, appears to have held a fascination for Mesopotamians, who used the figurines as amulets. Mesopotamian clay tablets refer to certain varieties of wood and to gold and lapis lazuli coming from Meluhha. Ivory too was a Harappan item used in southern Mesopotamia.

As mentioned earlier, Mesopotamian kings recorded with pride the arrival of Meluhha boats at their docks. Mesopotamia was a land with no stone, metal or good wood, and neither a seafaring nation nor a maritime economy. From the movement of artefacts and the testimony of the tablets we can tell that the trade and seafaring initiative lay largely with the Harappans. Stray Harappan weights and seals, and the seal of an interpreter of the Meluhha language at Mesopotamian sites testify to the residence of Harappans abroad. Strangely, however, this was not the pattern at the onset of the Bronze Age. We had mentioned the finely painted Mesopotamian pottery in Oman graves around 3100 BC; even earlier, before 3500 BC, southern

Mesopotamian pottery of the Ubaid type occurred on both shores of the Gulf, up to Qatar. It is possible that the beginnings of inter-regional trade occurred on Mesopotamian initiative.

An eastern neighbour of Mesopotamia was Iranian Elam, often incorporating not only the lowlands adjacent to the Tigris-Euphrates plain but also the Zagros uplands to their east. At Susa, a political centre in the lowland, Harappan-type artefacts have been found. It is not known whether there was direct interaction between Elam and South Asia or whether the material came to Susa via the Mesopotamian cities.

This summary of the place of the Harappan civilization in its world should not lead us to believe that it was commerce alone that made this world one. The establishment of state boundaries, implanted colonies, warfare and prospecting for minerals would all have amounted to movement, migration and dislocation of peoples. Information about peoples and places would have spread through uprooted people and peripatetic animal-herders, and so would knowledge about new techniques or newly-discovered goods. Intermarriages would have occurred. Mortimer Wheeler suggests that in the cemetery at Harappa, a grave with a wooden coffin and reed shroud is in the Mesopotamian and not the Harappan tradition, and that this is the grave of a young woman. Was she the foreign wife of a resident? Some people would have become bilingual, as indicated by the seal of the interpreter of the Meluhha language. Mesopotamians appear to have been charmed by the Indian monkey and the peacock, and presumably some Harappans saw the Bactrian camel in Kalibangan or in Mohenjo-daro (even if they did not fancy it, for it is depicted on just one figurine at Shortughai and possibly one copper tablet of Mohenjo-daro). Popular cults, fables and legends would also have spread far, across cultures. In one study of the Mohenjo-daro human figurines it has been concluded that the population was of diverse stock, judging from the variety of facial features, jewellery and hairstyles; that Mohenjo-daro was a truly cosmopolitan city.

4

Material Culture I: Communication, Public Economy

Let us now move on to some aspects of the Harappan material domain. We shall concentrate on aspects relevant to the economy and social structure. Much of the material described below comes from just two sites, Mohenjo-daro and Harappa, for these were the richest in terms of the extent of the excavations, the volume of antiquities uncovered, their range and variety, and the forms of architecture.

Communication

A widespread polity or political network with an urban economy and a system of state control could have been operational only if its modes of communication were effective. As the modern saying goes, the system is only as good as its weakest link. At the literal level, communication involves transport mechanisms: roads, pack animals, carts, river routes, boats.

Oxen would have been the pack animals—long caravans of them can ensure movement of bulk goods. The donkey was bred before 3000 BC in Egypt and was used to carry loads; it is an animal of northeastern Africa and was either introduced into western Asia or was indigenous there too. In western Asia and western India, however, it is the onager or khur whose bones occur more frequently than donkey bones at early sites. This animal was never domesticated or used as a load-carrier. Still to be seen in the Rann, it is a small and swift desert creature but not powerful. Current opinion is that the camel bones at Harappan sites represent the Bactrian camel. This animal did not however come to stay, for except at Pirak in the Kacchi, post-Harappan sites present no evidence for this two-



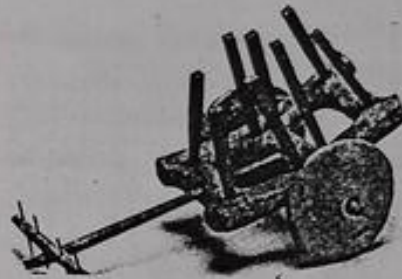
Model of a cart with driver, to which archaeologists have attached ox figurines

humped beast. In the iron age in Kathiawad it was the Arabian camel, one-humped, that was used.

Bullocks would have pulled carts. Many clay toys from Harappan sites represent either cart-frames or wheels, and we can tell that

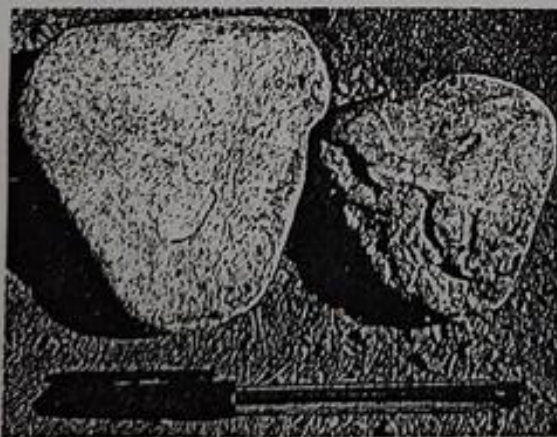
the carts were often two-wheeled, and that the wheels were solid constructions of three accurately fitted planks cut into a circle and pierced at the centre so as to be fixed on an axle, sometimes carrying a projecting hub at the centre. At some Harappan sites small models of carts and wheels occur in large numbers.

The solid wooden wheel is perforce a small one—only when the spoked version was invented could wheel diameters reach about two metres. However, cart-ruts made in a road in Harappa indicate that the body of the cart was not very small—the ruts are a little over a metre apart—compared to modern vehicles.



Model of a cart with sockets in the frame, in which the PoWM has fitted wooden sticks to indicate posts

The bullock cart can roll along uneven, bumpy surfaces, unlike the lightweight horse chariot that was invented in the iron age and which requires a good (smooth) road. Not surprisingly, with the possible exception of chalcolithic Daimabad in Maharashtra, it is only in iron-age towns like Rajghat, Kausambi and Ujjain that surfaced roads occur.

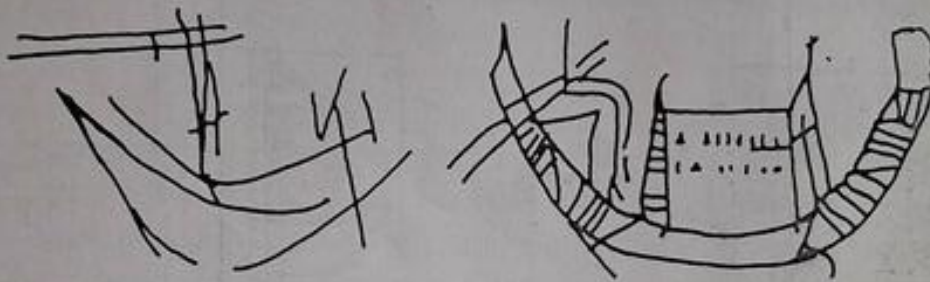


Terracotta 'cakes'

These are mostly absent in Harappan towns, despite the fact that the Harappans made hard-baked terracotta 'cakes', flat and triangular, by the hundreds, for use in fireplaces and as paving material to keep bathing floors

free of mud. One of the few exceptions is a 2.8-metre-wide street at a city gate at Harappa paved with flat terracotta cakes and potsherds.

While the movement of oxen and carts is slow and cumbersome, a river boat moving with the current can cover about 100 kilometres in a day. A boat can carry as much load as can several animals, with the additional advantage that there are no animals to feed—the energy being provided by the water current or the wind. Thus river transport is many times cheaper than overland transport. A river boat with a high prow and stern suitable for halting at steep riverbanks appears on a Mohenjo-daro seal impression. There are two steering paddles and a deck cabin. Further, we know that sails were in use in Harappan times because a clay boat model from Lothal has a socket for the base of the mast, and the form of a sailing boat with



Picture of a sailing ship, scratched on a pot River boat with cabin, on a seal

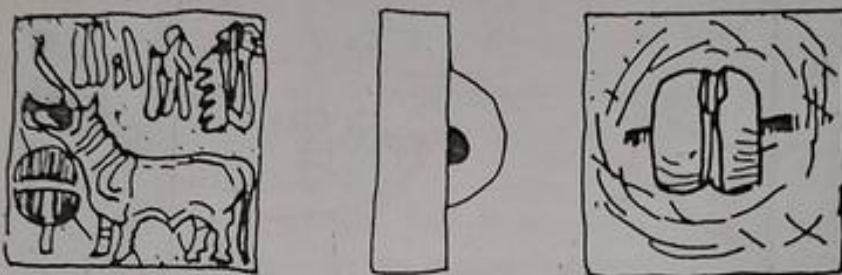
two yards is sketched on a pot. This evidence, plus the earlier mention of river stations at the navigation heads of the Chenab and Sutlej, shows that the economic system depended largely on river transport. We need also to note in this context that urban-rural networks, specifically traffic in people and goods, would have depended on two products of advanced carpentry: the cart and the boat (except when logs of wood were floated down rivers). These, in turn, would have been successfully made only when a range of bronze tools was available that enabled the carpenter to get all the parts to join and fit with accuracy.

Seals

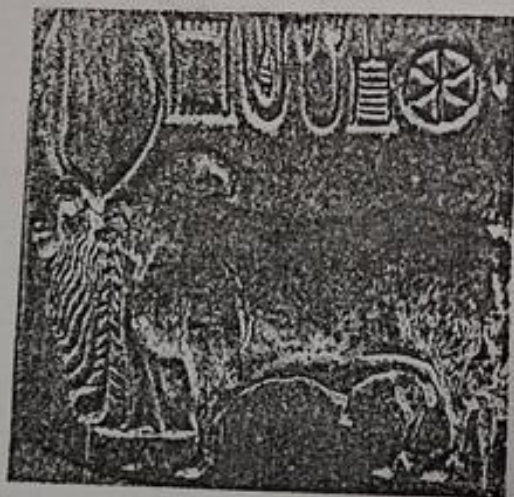
Other kinds of communication would also have been necessary. People were no longer confined to small-scale groups and face-to-face dealings with their kin. Now, a member of an elite family

might have to interact with a peasant, or an urban resident deal with a visitor he had not met so far and whose origins were unknown. Even though archaeological evidence on such social skills is not available, we cannot underestimate their importance in a society with a regional division of labour and developed political institutions.

Communication can be both verbal and non-verbal, and where the seals are concerned, both modes are relevant. Harappan seals were cut out of steatite, a soft stone with a hardness of 1 on Mohs' scale,¹ easy to saw, smooth and carve. On most seals the operative face was carved in intaglios or inverse relief, with the figure of an animal and a row of written symbols. When stamped on a plastic surface like wet clay, the seal would yield a positive relief image and a verbal message that could be read. Sealing with clay would protect



Obverse, side view, and reverse (with perforated boss) of the standard Harappan seal

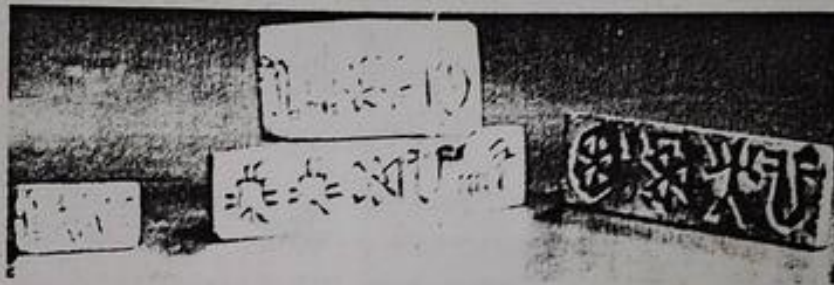


Impression of an inscribed seal

the contents of a pot or a cloth package, and also reveal the identity of the sender/sealer of the pot/package. A projecting and perforated boss on the reverse of the seal enabled a person to tie it with a cord to the wrist, and to handle it for stamping. Bronze knives, small saws, burins, and perhaps drills would have been the tools used to shape the seals. They were then coated with a white substance and baked—this

¹ This is a measure of the hardness of minerals, with diamond, at 10, being the hardest. Diamond can scratch all others, lower in the scale, from 9 to 1.

increases the hardness of steatite from 1 to about 6 on Mohs' scale, and makes it fit for the wear-and-tear of stamping. Sealed clay would break on the opening of containers or packages, but occasionally an accidental fire in antiquity could bake hard a sealing still fixed on its container/package and preserve its surface, even as the cloth, reed or matting of the package was reduced to ashes. It is this kind of chance occurrence that confirms the function of the Harappan seals. On the reverse of such baked mud pieces can often be detected the impressions of cloth, and/or fibre and knots.² Significantly, there were also tokens or tablets with short written messages, of clay or faience, that were made in moulds. One would think that such a technique was used because certain messages had to be issued in multiple form, but this is only a guess.



Inscribed tokens, made in moulds

An overwhelming majority of seals and sealings carry as the main image the 'unicorn', usually with an object scholars call the 'sacred brazier' or 'sacred manger' (we do not know what the latter object was) in front of it. The unicorn was clearly a mythical beast, a composite of the features of several animals. The 'sacred brazier' itself is shown on a gold head ornament and thus had not only sacred but also elite associations. Besides single animals there are also on some seals (fewer in number), images of horned personages or tree spirits, and geometric motifs. In sum, the Harappan seal communicated both verbal and non-verbal information and significance, and was a functional artefact (for stamping) that could also have been worn as a talisman at the wrist. We shall revert to the seals later in Chapter 7.

² At contemporary sites in southern Iran, in contrast, seals were used on lumps of clay stuck across house doors and door jambs.

Script and Language

As for verbal communication through writing, it needs to be understood that no one has as yet succeeded in deciphering the Harappan script and that this will remain an unlikely eventuality unless a bilingual inscription—in Harappan and a known form of writing—is found, that incorporates the names of people or places.³ The Harappan script is logographic: there are 375 to 400 signs, which rules out an alphabet (where one sign stands for one vowel or consonant) because alphabets usually have no more than thirty-six signs. Often Harappan bangles or metal tools are inscribed with just one sign. Harappan writing goes from right to left, as can be made out from close examination of overlapping signs scratched on pots. Short strokes indicate numbers, and numerals precede other signs, which could mean that in the Harappan language adjectives preceded the nouns they qualified. Certain signs, computer concordances reveal, tend to occur frequently at the end of inscriptions, which points to a language using a set of phonetic suffixes.

The Harappan language was probably agglutinative, or a language which added suffixes to an unchanging root. This feature is characteristic of the Dravidian language family rather than the Indo-Aryan languages. This, and the fact that the earliest Indo-Aryan text, the *Rgveda*, shows Dravidian influence (indicating that the early Indo-Aryans in the northwest had some contact with Dravidian speakers), make it likely that the language of the Harappans was a Dravidian one. (Note, also, that Brahui, spoken in the hills of southern Baluchistan today, is a Dravidian language.)

The inscriptions on the seals being brief, on average five to six signs long, they probably gave little more than the owner's name and designation. Perhaps it was the pictorial (often solo animal) emblem, rendered with great skill, that indicated the lineage, ancestry or social origins of the owner. There is no geographic pattern to the occurrence of the various seal animals (unicorn, bull, rhinoceros, antelope, tiger or elephant), so the animal could not possibly have signified the place of origin of the seal owner. Perhaps it was this pictorial image that lent authority to any spoken message that

³ Only known names would give us the first clues as to how some signs were vocalized.

accompanied a seal or an object stamped with one. It may be noted that so far it is Harappa and Mohenjo-daro—and mound E rather than the 'citadel mound' AB at Harappa—that have yielded the evidence for the most intensive writing activity. These were probably centres of administration.

Harappan writing occurs on pots, seals, bullae, terracotta (stoneware) and shell bangles, copper tablets and tools, and ivory rods. Large numbers of scored goblets with pointed bases that occur at Harappa and Mohenjo-daro are important as they are one of the very few pottery forms that can occasionally carry seal impressions (as distinct from scratched signs)—their use remains a mystery. We get the impression that writing was for humdrum purposes. A striking exception to this is the occurrence of a huge 'public' inscription that seems to have been set up on a street at Dholavira in Kutch, with letters about thirty-seven centimetres high cut out of stones and, R.S. Bisht suggests, fastened on a wooden board.

The most important point, however, is the enormous intellectual advance that the emergence of writing signifies. When we speak we utter sounds in one or other language using a series of sound sequences that carry specific meanings in that language. What writing does is to encode in visual form, that is, through a set of distinct symbols or signs, those sounds and sound sequences—thereby conveying meaning or information. Further, writing makes possible the storage of information or the maintenance of records for future reference. It makes communication at a distance possible. It requires of the writer knowledge of the signs and some amount of manual dexterity, and of the reader, knowledge of how the visual signs are vocalized and of course familiarity with the relevant language. Writing has been termed the most momentous invention human beings have ever made.

The Public Economy: Crafts and Metalwork

Some Harappan artefacts reflect the existence of an economic system more wide-reaching and elaborate than householding. For example, stone weights have been found at about twenty-five sites, large and small. At Mohenjo-daro about 200 weights were found, at Chanhudaro 100, of which twenty-two came from a stone-cutter's house. The metrology (system of measurement) behind these was



Cubic weights, large and small, POWM

whittle down the stone to the exact weight required.

There is a pillared hall on the citadel of Mohenjo-daro. Given the lengths of timber beams then available, it was possible to roof or span widths of about 4.5 metres. Any space larger than that would have needed pillars to support the roof. The pillared hall is roughly twenty-five metres in length and width, and its roof was thus supported on four rows of five rectangular pillars each. The function of the hall, which was very carefully and skilfully paved with baked bricks, can only be guessed. Perhaps many people were required to be present in it at one time and for important purposes. Did the rulers hear their subjects in this hall?

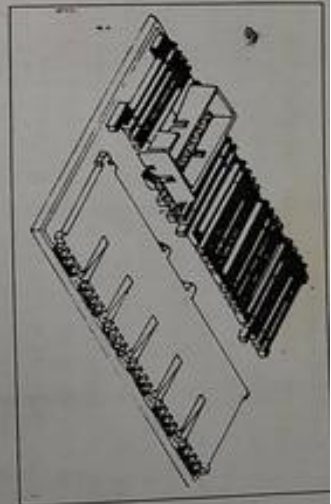


What remains of the pillared hall today

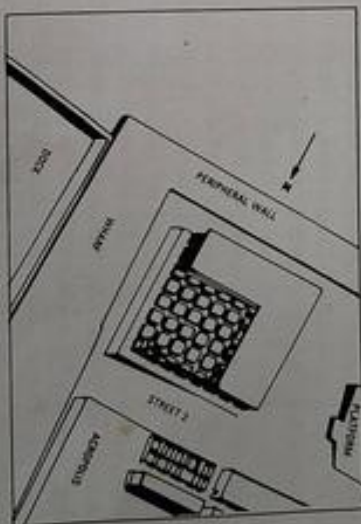
Three Harappan structures have been identified as storage facilities. These are at Harappa, Lothal and Mohenjo-daro. The building at Harappa is the largest of the three, and the actual floor space of its rooms (each raised on three longitudinal sleeper walls) is also the largest, totalling 986 square metres. The building at Lothal, consisting of rows of brick platforms (832 square metres in total floor space), is larger in floor space than the one with three rows of nine platforms each (750 square metres) at the immensely larger town of Mohenjo-daro. What was stored in these structures could not have been local produce alone. And the Lothal structure was burned down

investigated and it turned out to be a system of multiples of two as well as ten — 1, 2, 4, 8, 64, 160, 320 and so on. Fractions of the unit which weighed 13.63 grams were $\frac{1}{2}$, $\frac{1}{4}$ and so on to $\frac{1}{16}$. The unit of 13.63 grams was often a cube of polished chert, its corners bevelled, presumably to

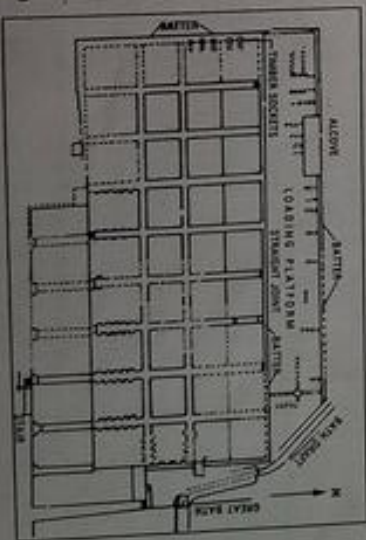
Storage structure at Harappa on sleeper walls



Storage structure at Lothal with rows of platforms

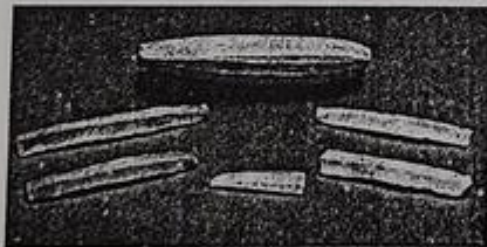


Plan of storage structure at Mohenjo-daro with rows of platforms



in antiquity so that, together with charred lumps of roofing material, there were also clay sealings. (These, we have seen, are not matched by any seal from Lothal, which means that the packages stored in the structure would have come from elsewhere.) The fact that the sealings bear marks of cloth and string, and no burned grain was found, points to storage of small-volume consignments rather than wood or grain. Thus these three structures may not have had anything to do with storage of grain collected as harvest tax on local agriculture, even if they did provide storage space for goods in trans-shipment, and we should therefore refrain from calling them granaries. (This does not eliminate the possibility that several granaries, permanent or impermanent structures, lay elsewhere, out in the countryside.)

A noticeable feature of the assemblages (the range of artefacts of different materials and forms) from Harappan sites is that they are not as similar in items of jewellery, miniature faience containers or inlay decorations as in artefacts of everyday utility. Foremost among the latter is the long blade of chert stone from the Rohri limestone hills in northern Sind. The blades were made here⁴ and were in use at dozens of Harappan settlements as far apart as Balakot, Lothal, Ropar on the Sutlej, and Shortughai on the Oxus. Flaked stone tools had been in use all over the world wherever there were hunters and gatherers, but to make the long parallel-sided blade required special expertise in pressure-flaking. In the late stone age and the neolithic-chalcolithic sites of South Asia we find several forms of flaked stone tools. People had learned the utility of a variety of tool-types centuries before the Bronze Age. Yet at many Harappan sites the



Chert blades and core, PoWM

form was restricted to the long blade. Moreover, close examination under the microscope has revealed that it was bronze points that were sometimes used to flake off (by application of pressure) these long blades

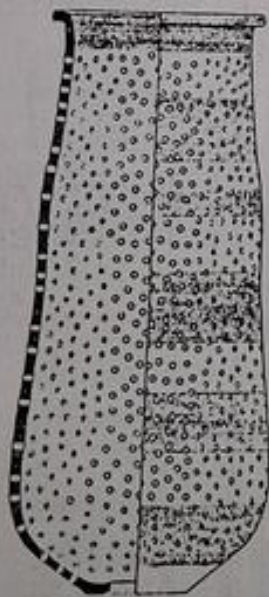
⁴ Careful surface observation brought to light several semi-circular patches cleared of stones, where stone knappers had sat to strike off chert blades in the Harappan period. Hundreds of chert blocks from which blades were removed, are found on the outcrop. This area also provided massive limestone for the column bases used at Mohenjo-daro and Harappa.

of stone. (Apparently this was a particularly efficient method giving about forty blades per core, and wider blades as well.) So we can infer that bronze, though it is scarce at some sites, was regularly utilized for everyday purposes.

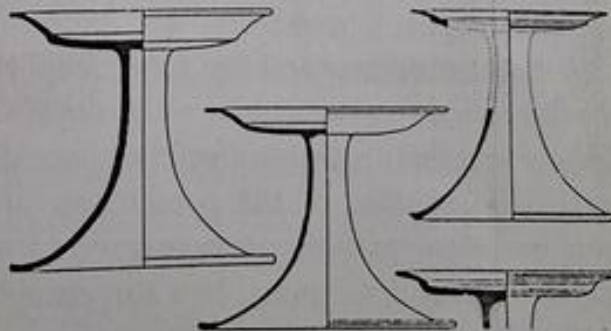
Like the major stone tool form, Harappan pottery in the Indus valley is distinctive. It is thick-walled and heavy, baked red to its core and therefore very strong. Often it was given a red slip⁵ but much of the pottery was not so coated. Many pots were painted black—the pipal leaf, the intersecting circle and the peacock were popular motifs seen on Harappan pottery even as far as Shortughai. Among the shapes are a tall, flat-based and straight-sided jar with large perforations through the walls. Some suggest it was meant for catching fish, others that it was for burning aromatic substances. The often large ‘dish on stand’, we surmise, was not for the hearth but for eating out of, or for serving, or for offering—for ‘social’ rather than utilitarian purposes. It is a product of potting skill: for the potter to set the hollow stem or stand exactly under the centre of the dish must have been difficult. Another perhaps socially significant—



Painted potsherds, PoWM



Perforated jar



Dishes on stands

⁵ If we use very fine-particled clay for the body of a pot it may not hold its shape. So a certain degree of coarseness in the clay fabric is essential. But the surface may be given a ‘slip’ of a very fine solution of clay so that the exterior is smooth. This enhances the aesthetic value and also reduces the porosity of the pot. It makes painting on the pot surface possible.

because it is profusely painted—pot form was the S-profile vase, often very large in size. As for large storage vessels, they often take pointed lower portions presumably because they were set into the house floors.



The S-profile vase,
National Museum of Pakistan

50s in
icks/pak?

The close similarity of form and decoration in pottery across Harappan sites makes us wonder who the potters were. Pottery is not an easily transported item and to suggest that the uniformity was due to 'trade' is awkward, and in any case leaves open the question as to why more than one range and quality of pottery was not traded. I would suggest that the rulers directed and organized pottery production at many centres. (Similarly, bricks were of uniform size not because of trade in them—such trade in a heavy and bulk item could never have been lucrative—but because people were mobilized to mass-produce them.)

In contrast stands Harappan textile production (wool and cotton): the material, size and design of Harappan spindle whorls is of such bewildering variety that we conclude that spinning and weaving were done individually in the household for domestic needs, unlike pottery-making. Actual traces or impressions of cotton thread and cloth were found on sand moulds, bronze tools, silver vases and bricks, at Harappa, Chanhudaro and Mohenjodaro.⁶

Because copper and lead/tin/arsenic are scattered over the face of the earth, any prehistoric technology based on these metals would have entailed organization of their long-distance procurement, of specialist smelting, of the production of large quantities of charcoal fuel required in the ore preparation and smelting, and of the casting of tools and weapons. Not surprisingly, Harappan bronze tools and weapons take a limited range, and are repeated at most sites with only minor variations.

⁶ The impression of a flax (*Linum usitatissimum*) seed on a brick was identified at Shortughai. Linen from flax, however, is attested much later in India, although it was already made in the early third millennium BC in Egypt and was known at Shahr-i Sokhta, also in the early third millennium. At chalcolithic Chandoli in western Maharashtra, in the later first millennium BC, some copper beads were threaded on flax.

Many artefacts were cold-hammered (copper is a ductile material which can be flattened and shaped by hammering), others (vessels included) were cast in moulds. The cold-hammering of sheet metal was mastered in many parts of Asia centuries before the third millennium, when

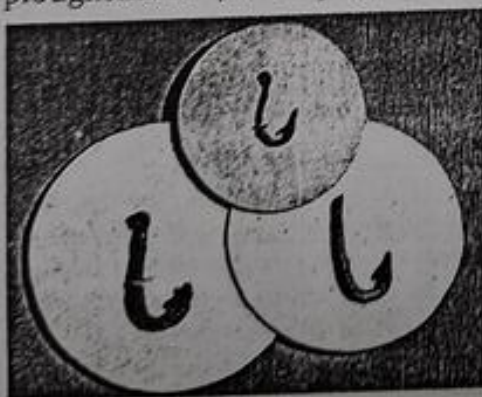


Vessels of beaten copper

native copper (copper in metallic form) was in use. And this technique continued to be in use even after closed-mould and lost-wax casting were invented—indeed, in Iraq and India it survived into the twentieth century. Although it is labour-intensive cold-hammering makes economic use of metal, as utensils (a number of which are on view at the National Museum, Delhi) can be produced with far thinner walls than those of cast objects.

Copper/bronze artefacts have been found at most Harappan sites. The full range of tools comes from the two major cities; a medium-sized town like Kalibangan has produced hundreds of metal tools and pieces, but at Amri there were extremely few bronze tools. At a few sites, including Lothal, bun-shaped copper ingots were found. At some west Asian sites it has been found that this kind of ingot formed at the bottom of a smelting furnace (beneath a layer of slag) when high temperatures and long-burning kilns were in use.

We know of no metal tool devised specially for use in the fields. The first excavators of Mohenjo-daro thought certain large, roughly-shaped blocks of flint, unevenly rectangular in shape, were ploughshares (so displayed in museums in Pakistan) although



Bronze fish-hooks, PoWM

Marshall had noted that they were very roughly flaked and were actually unfinished. (The terracotta model of a plough from Banawali, however, attests to the use of thin and pointed shares and not massive blocks like the flint objects.) Fish-hooks of metal were used. Harappan metal axes take a rather undeveloped, flat

21CAT



Bronze flat axe in a modern wooden haft, PoWM

form, with rounded working edges or rectangular in outline. It is not known how efficient such tools, which were devoid of strengthening mid-ribs, could have been. And this is intriguing, given the



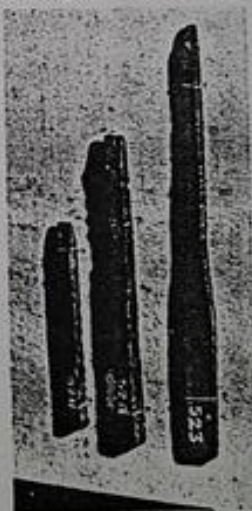
Razor (left) and knife (top right) PoWM



Bronze arrowheads on display, PoWM

fact that ground stone axes and adzes, in use since neolithic times, are exceptionally scarce at Harappan sites.⁷

In metal weaponry there was the swallow-tailed arrowhead and a few daggers or swords of bronze. There was a characteristic razor, its round blade exceptionally thin. Mirrors, large vessels and weighing-scale pans were also made of bronze. Most important were the sharp- and accurate-ended bronze tools for craftwork: the adze with either a splayed or a narrow working end for slicing wood across its grain (albeit without a midrib); the chisel in a whole range of sizes and shapes, its sharp end held against the surface to be worked and the other end struck with a piece of wood; the punch with a transverse working end for perforation; the drill or narrow hollow tube for carving or perforation; and the gouge with a hollow round end pressed in order to ream out mortises (cavities) from the thickness of wooden



Bronze chisels, PoWM

⁷ Stone saddle querns, however, occur in large numbers at the major sites. Most were made of basalt and had slightly concave working surfaces. Mullers to grind grains on them were also found.

planks that had to be accurately fitted to other pieces. Knife blades, flat axes and curved toothed saws were also in use. Hard woods, shankh-shell, ivory, lapis lazuli and carnelian (one of the harder stones) are some of the materials that were worked with the use of a bronze tool-kit. As indicated above, copper could have come from Rajasthan (the Aravalli belt down to the vicinity of Mt Abu) or the Shivaliks, from Oman, or from Chagai and other localities in Baluchistan. (There are several rich copper sources in western Afghanistan and eastern Iran as well.) Tin is a relatively scarce metal. It is possible that stream tin was panned at the Kokcha river near Shortughai; there is also the possibility of tin having come from a locality south of Herat in western Afghanistan. (Other sources of tin lie in Anatolia, north-central Iran and the Egyptian desert, unlikely as regular sources for South Asia unless the metal went there via southern Mesopotamia.)

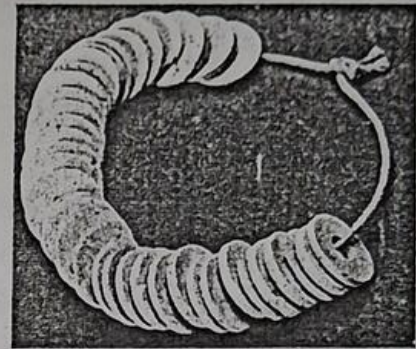
Scientific analysis of the impurities contained in metal artefacts does not really point to the mine source of the metal, as was believed in the 1950s and 1960s. Other than many technical reasons and statistical problems, a major factor is that people melted, re-melted and re-cast old, broken copper and bronze and gold objects, so that in actual fact metal from diverse sources came to be regularly mixed together.

The Harappans did not use tools only of metal. There was stone, as mentioned above, and at some sites bone tools were in use. It appears that the spheres of production dependent on bronze tools were carpentry, seal-carving, ivory-cutting, and bead-shaping and drilling, although stone drill heads can also be used to perforate stone beads.

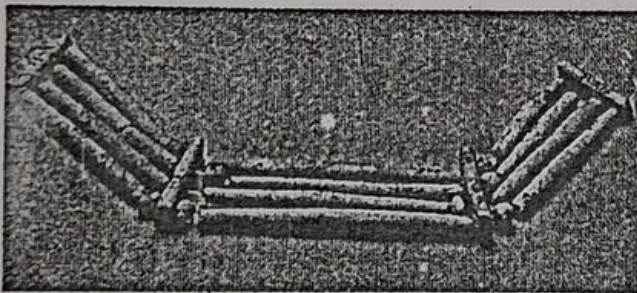
[Much ivory has been found at Mohenjo-daro: hooks, pins, awls, inlay pieces (for wooden furniture, perhaps), roundels, game-men, sticks with incised circles, combs, decorative appendages to boxes or furniture, etc.] Tusks occur at a few sites. Saw and chisel marks have been detected on decorative ivories. Ivory is not a particularly hard material—a little above 2 on Mohs' scale—and the grain is fine and does not restrict the carving, as is the case with wood. It is hard enough to take intricate carving; at the same time, the waxy substance in its pores makes it elastic and ivory can gain a good polish with the use of abrasives and the stems of certain plants. The

reason why it was extensively used only in the Harappan period, not earlier, may be that it was now that tools of the requisite sharpness, appropriate shape and small size (such as narrow-toothed saws, tubular drills and fine narrow chisels of bronze) were available for carving—although saw marks on some pieces indicate that the carver was cutting out a piece of ivory with difficulty—and that there was elite demand for this attractive material. In his study of the ivories from Mohenjo-daro, Mackay came to the conclusion that there was no carving in the round, and no artwork as such, only objects of daily use or decoration, in ivory.

Soft steatite was used not only for seals but also for beads, often microscopic in size and made of a paste of the pulverized stone. Long cylindrical carnelian beads must have been difficult to perforate; this stone was perhaps procured from Rajpipla–Ratnapura on the Narmada, where it occurs in large pebbles,



A string of steatite beads, PoWM

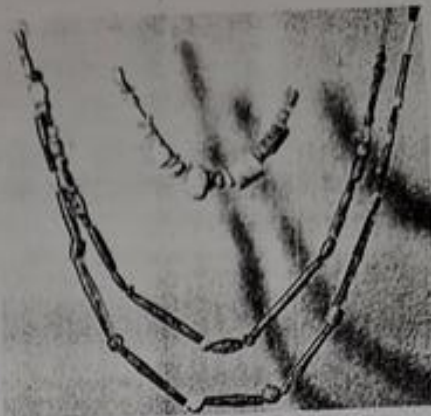


A necklace of long terracotta beads and spacers, PoWM

and/or from the vicinity of Ujjain. Carnelian beads were made at sites like Mohenjo-daro, Lothal and Chanhudaro. It must have been prestigious to wear necklaces of long carnelian beads, for there were clay imitations of them. Some carnelian beads were given a white design that was etched into the surface and filled with a white pigment. The pigment was made to adhere to the stone by heating.

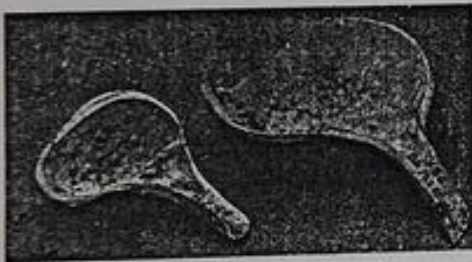
Carnelian, with a hardness of over 7, is more difficult to work than lapis or turquoise (hardness of 6.5 or less). The interesting technical factor is that bronze drills (which have a hardness of less than 6) may have been of no use on carnelian without an abrasive—the powder of a stone harder or equally hard—which would do the actual perforation when moved or pressed by a sharp bronze tool. One of the most remarkable of Harappan craft items, unmatched in the third-millennium world that we sketched in Chapter 3, is the long

and narrow carnelian bead, up to ten centimetres long, found at several Harappan sites (Mohenjo-daro, Lothal, Chanhudaro), and also overseas, in Mesopotamian towns. (Although carnelian is hard, it has a conchoidal fracture when struck or pressure-flaked, so that it is not the shaping of the beads but the perforation and polish that are the challenge for the lapidary.



Strings of long carnelian and other beads, PoWM

The softer lapis lazuli rock, in contrast, has no conchoidal fracture and thus gives beads that are of smaller size, not well-polished, and often of asymmetric shape.) At a carnelian bead production locus in Lothal, it appears that the pebbles were roasted so that the stone would take on a deep red hue. For this, saw dust was apparently used to pack the pebbles, and the fuel comprised not just charcoal but also cowdung and reeds, which would give steady heat but not at particularly high temperatures.



Shell ladles, PoWM

Shell was a frequently used material for ornaments (especially bangles), ladles, cups for libation or ablution, containers and inlays. Shell-working (identified by heaps of waste pieces) was located at Mohenjo-

daro, Nageswar, Balakot and Lothal. Entire shankh-shells were buried in Mesopotamian royal graves, and sometimes even 'shankhs' made of silver or gold! (This shell, incidentally, is available only off the Indian coasts, not in the Gulf.) At Balakot, the analysis by J.M. Kenoyer has revealed that shankh-shell bangle-cutting required the use of bronze saws, but not so the cutting of bangles from *Tivela damaoides*, a bivalve. Both shells can be obtained in local waters. While shankh-shell bangles are ubiquitous at Harappan sites, those made of the bivalve were used only at sites in Makran and at Allahdino near Karachi.

Faience was a synthetic material, an imitation gem, popular in the Harappan civilization as in Central Asia, Mesopotamia,

Bahrain and Egypt. Faience was made of finely powdered quartz sand, with colorants and other substances added and all heated to temperatures between 900 and 1100°C so that some of the ingredients melted and held the rest together. A glaze was added separately or was acquired in the heating process. The molten substance was poured into moulds to take the requisite shape. Figurines of squirrels or rams, perforated and presumably worn as amulets, bangles and



Bronze bracelets (below) and rings (above) with fragments of faience bracelets (top). PoWM

heads, and pendants, as well as miniature pots (to hold expensive perfume or a cosmetic?) of faience in various colours have been found at Mohenjo-daro and Harappa. At the other sites the repertoire of faience objects is much more restricted.

So too is the case with gold and silver: there are gold beads of different shapes, hollow conical hair ornaments, gold wire, pendants and so on at the major centres and at some of the smaller sites like Banawali and Lothal; there are only a few scraps, if at all, at the other sites. There is no silver at Lothal, Kalibangan or Chanhudaro, whereas silver vases, bars or lumps, bangles, a seal and other artefacts occur at the two major cities.

Some jewellers' techniques were fairly advanced even if not as spectacular as, say, the profuse gold granulation work of Mesopotamia—where large amounts of fine, high-status craftwork survive in the archaeological record because of the Mesopotamian ideological predilection to bury eminent people in opulent graves. In the Harappan repertoire there was the technique of filigree (drawing fine gold wire to coil on a silver brooch), soldering of gold and silver, tracery on gold, and some granulation (decorating a metal surface with miniature drops of gold, each glued or soldered in place, which is an immensely difficult technique⁸). For the rest, gold and silver-working was not very different from copper or bronze. While copper (one of the strongest metals when pure) melts at 1083°C (its

⁸ Modern European jewellers are known to have taken very long to reinvent this technique.

smelting temperature can be much lower), tin melts at about 232°C , which makes bronze, an alloy of copper and tin, easy to melt and therefore cast. Bronze with 13 per cent tin melts at 980° instead of 1083°C . It may be useful to know that lead melts at 327° , silver at 960° , and gold at about 1064°C .

In the context of pyrotechnology it is also necessary to take note of the stoneware bangles found at a few sites. These were heavy and solid, baked to render the clay exceptionally impervious to water, in closed and coated and occasionally seal-impressed pottery jars. They turned out black to grey and are certainly neither delicate nor 'pretty'. They occur only at Harappa and Mohenjo-daro where there is evidence for their manufacture, and rarely at other sites like Kalibangan and Lothal. Quite significantly, they sometimes bear inscriptions. While one suggestion is that the stoneware bangles were votive objects offered, say, by women wanting to have sons, another is that the bangles were awards or marks of honour bestowed on certain people.

Paradoxically, weaponry could also have been the realm of lapidary craftsmen. For other than the bronze arrowheads and swords/daggers found, there were mace-heads of sandstone, limestone and alabaster, numerous enough and skilfully made at Mohenjo-daro, Marshall says, to show that they were 'in common use'. The carefully-made, lentoid-shaped mace-head is said to be a formidable weapon when mounted on a stout stick.

Craft 'Specialization'

It will be obvious that most of the crafts we have mentioned above were not the unskilled sort to which gangs of peasants or prisoners-of-war could be set. Neither would they have been simple off-season leisure activity for agriculturists. They required knowledge of pyrotechnology and raw materials, and manual dexterity in different degrees, and this is what we mean by 'craft specialization'. For example, even a seemingly simple 'stone age' activity like the flaking of long chert blades, to be done efficiently, had to be learned and mastered, much stone being wasted till then. This, the restricted availability of chert, the wide distribution of the blades, and the use of metal points for flaking indicate that this standardized tool for everyday use was the output of specialists.

[However, crafts like pottery-making and metal-smelting, and also pursuits like shell-diving/collecting, would have been practised only in season, and it is not easy to suggest that a seal-cutter or metallurgist remained busy at this work all the year. An additional point is that seasonal bottlenecks in agricultural labour requirements, especially where lift irrigation was necessary, could have seasonally absorbed skilled craft-producers into agriculture, as has been the pattern in historic India.]

Craft production is not unique to urban societies. For example, the hunter-gatherer Chenchu people near Hyderabad, though until recently clad only in leaves, made, amongst other equipment, superb bark baskets for honey, carved wooden dishes and ornamented wooden combs. So also, the Bhils in western India did not make their own cloth or pottery but knew how to make musical instruments, a whole range of bamboo containers, and wooden chests. They are reported to have produced wickerwork mats and baskets for exchange at peasant villages or in towns.

In our context, however, the inference is that there were urban artisans who produced for exchange—that is, they manufactured things for others. This implies some degree of regularity of turnover. This kind of production develops as political institutions develop. The elite foster craft production by providing custom (demand) for finely-crafted ornaments or utilities made of exotic or rare materials, and by organizing the procurement of the necessary materials and providing the infrastructure. They control the circulation of quality crafts by bestowing them at weddings or inter-tribal/inter-local visits, or as tokens of honour. They also set the tastes or the aesthetic norms. Thus craft specialization is never a 'purely economic' phenomenon spurred on by 'agricultural growth'.

The archaeological evidence for craft specialization in the past is rarely clear or abundant. For one thing, the manufacturing place as distinct from the residence is a very late phenomenon in world history. Besides this, pottery-making and firing, shell-cutting and other activities could have been conducted in different spots outside town or village limits, with little chance for debris to pile up continuously in one place within the built-up area of a habitation site. At Mohenjo-daro we find evidence for craft activities on the outer peripheries of the lower city, in large and small residential

structures there, and also in the citadel. Evidence for the manufacture of a particular item at a given site is not constituted by the number of such items found but by production facilities (special-purpose tools, anvils, kilns, baking jars and so on), the quantity of waste in proportion to finished items, and the proportion of unfinished to complete items. Even in this matter, regular sweeping of floors and cleaning of work areas would remove all the evidence.

In sum, a variety of craftwork is attested at the sites but not only in the large urban centres; much of it obviously required special skills (some of these have been lost to the world); craft specialization is a necessary component of the Bronze Age economy but it is impossible to 'prove' that specialists were in continuous and exclusive craft production, even under elite direction.

Material Culture II: Artistic Representation

The Harappan cultural and symbolic world was peopled by animals, often untamed ones. Bones of wild animals occur at town sites and numerous clay representations have also been found. So also, the best glyptic art (carving on stone seals) represents animals. For a glimpse of Harappan artistic expression we thus begin with representations of nature, animals in particular. Some pottery decoration depicts foliage, or the strutting peacock, or a horned deer with head turned back towards a stylized tree.



The leaf motif covers
an entire vase



Horned deer on a vase
from Lothal



Storage jar from Chanhu-daro,
with peacocks and leaves painted over it



Foliage and geometric motifs,
painted on a pot

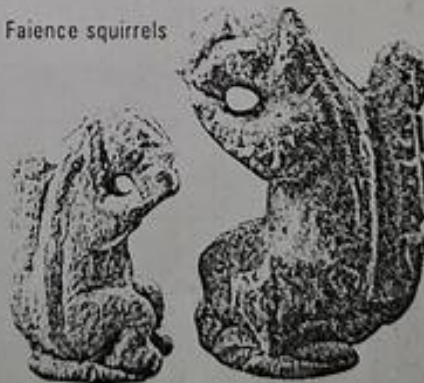
Carvings of animals in intaglios (reverse relief) on the steatite seals are often superbly executed. The tiger, elephant, rhinoceros and bull are the most vividly rendered of the animals. Three-dimensional representation is in clay and faience and to a far lesser extent in stone and bronze. We may also note that with the exception of a few seals, mainly from Mohenjo-daro, Kalibangan and Harappa, and a few painted pots, artistic representation is overwhelmingly of single subjects (persons or animals or birds) rather than 'scenes' or narrative.

Animal figurines are often of rough workmanship and careless on detail like the length of an animal's tail. Many are made of clay and faience. Rams and squirrels are frequently made of faience and are small enough to be worn as amulets. The rough hide of a

Faience ram



Faience squirrels



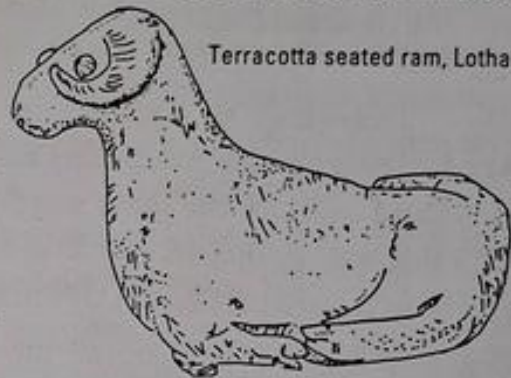


Terracotta rhinoceros



Terracotta bull

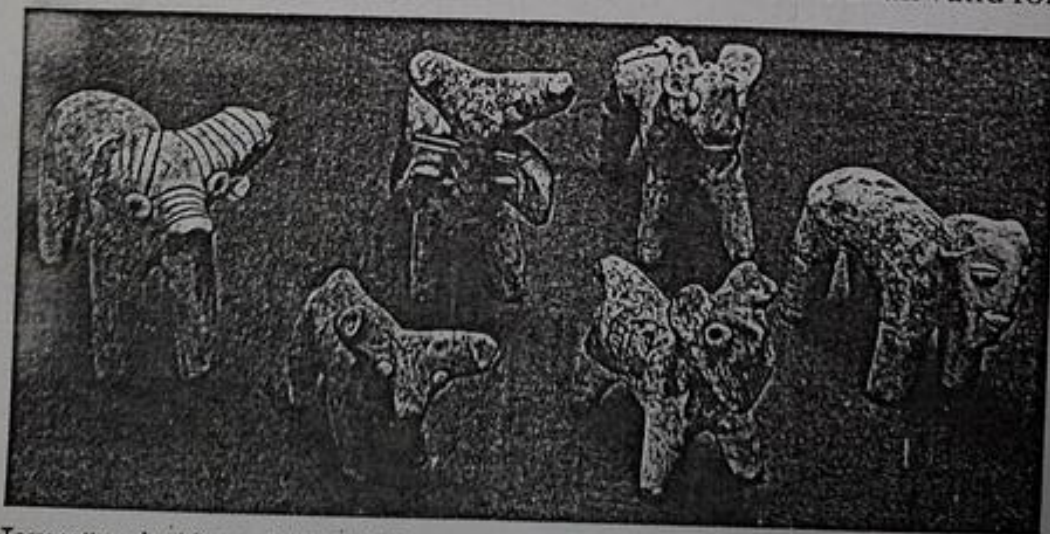
rhinoceros is depicted in a somewhat naive manner with appliqued and pitted patches over withers and hind quarters. Bulls are the most common animal figurines but are not always well-made. Often it is the species without the hump that is depicted. Note the garlands around the neck of the bull illustrated here. The terracotta model of a seated ram from



Terracotta seated ram, Lothal

Lothal compares favourably with figures from Mohenjo-daro; although the fleece is not depicted, the horns are well-modelled. Strangely, there is no cow and no figurine of the domestic cat.

The reader may have noticed that some of this terracotta work has a childlike air. While one would hesitate to call it children's work, for then we would have to identify an adequate number of instances of contrasting adult clay-modelling (such as the bull that we have illustrated above?) to sustain our argument, it could be suggested that some of these were toys. The problem, again, would be to distinguish toys from 'art', if such a distinction is at all valid for



Terracotta animal figures in the PoWM

protohistoric times. Or else, we would have to conclude that all clay-modelling was for, though not by, children. Another alternative is for us to label this category of representational work 'folk art', which is somewhat condescending but at least separates the terracottas made by the rolling, pinching and hand-modelling of an easily available substance, from products of skilled artisan-artists like glyptic and stone and bronze statuary for which special tools and costly materials were used.

In bronze is a buffalo, about seven centimetres long, that is on display at the National Museum, Delhi, remarkably vivid in spite of its small size. It was found in the Mohenjo-daro citadel. Consider

Bronze buffalo from Mohenjo-daro



also the bronze goat from Mohenjo-daro on a long tang or projection, with twisted horns. Both are miniatures and yet do justice to the 'personalities' of the respective animals.



Bronze figure of a goat on a broken pin, Mohenjo-daro

The rendering of people in clay is also, to our eyes, largely 'popular' or 'folk' work. The head-dresses in our illustrations are so schematic that we cannot imagine what they were made of. Facial features, hair, ornaments and parts of the body are applied (small bits of clay are applied to the main body) and are mostly out of proportion. A bearded male is in its turn quite crude, and I find some bawdiness in the rendering.





Clay figure of a seated and bearded man, Mohenjo-daro.



Vandalized stone statue



Stone head, Mohenjo-daro



The Priest King, a stone bust from Mohenjo-daro

A great contrast is provided by the stone¹ portraits of men which, although not of imposing size, are static and formal, and often in a particular seated posture. The formality of the 'Priest King' bust is marked in the carving of the mouth, ears and beard. Moreover, the trefoil pattern on the robe and the ornament on the forehead probably took an inlay or pigment² and the small drilled holes under the ears were perhaps meant to take a detachable head-dress, in which case the bust would have been gaudy, with far less charm than the slim nude 'Dancing Girl' in bronze.

The 'Dancing Girl', together with about a dozen animal figurines, is small and cast in lost wax. This is a technique in which

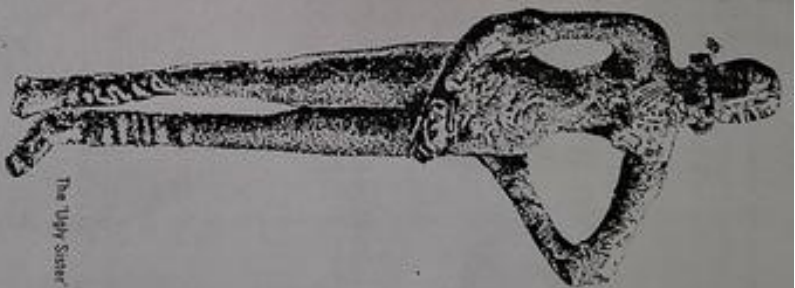
¹ To carve stone heads or statues the artists would have required full sets of bronze chisels of different sizes, fitted in wooden handles and struck by mallets. For the finish smooth pebbles of hard stone or sand on wet leather could have been used.

² Does it represent a pattern of rich embroidery on the robe?



The 'Dancing Girl': front and rear views.

the desired form is modelled in clay and then coated with wax. It is then covered with an outer layer of clay, with one or more apertures piercing it. Molten bronze is poured through the latter and the wax evaporates, allowing the bronze to coat the clay core. The outer layer of clay is finally broken and discarded. The 'Dancing Girl' must have been part of a larger object: the limbs are disproportionately long, and the left hand curls to make a large cavity in which a pole or rod could have been inserted. Her thick and long hair is aesthetically coiled into a bun at the back of the neck. The figure is nude but, as many have pointed out, the piece is innocent rather than erotic. Consider especially the gentle curve of the back and the buttocks in



The 'Ugly Sister'

the rear view. A very similar piece from Mohenjo-daro, also small and corroded, also shows a girl. Here it is the right hand which would have held something, and the left is loaded with bangles. Due to its ramrod stiffness and straight body, however, it does not have the charm of the first piece. A tang below indicates that the figure was fitted onto some object. I like to refer to this second bronze as the 'Ugly Sister'. The 'Dancing Girl', incidentally, was found by a fire-place in a ruined house in the southern sector of Mohenjo-daro, whose only notable feature was a carefully-paved floor. No significant context has been recorded for either of these bronze statuettes.

Material Culture III: ✓ Urban Form and Architecture

Mohenjo-daro is located at a short distance from the west bank of the present Indus channel. Digging has unearthed house remains of about seven metres depth, and perhaps older remains lie below the water table, so that all the evidence points to stability of urban life and economy at this location. The city would have been built amongst remnant riverine forest interspersed with agricultural fields and hamlets. In its vicinity we can expect five centuries of cultivation, tree-felling for fuel and other needs, human waste disposal, and extensive quarrying for mud (for bricks and platforms) to have perhaps scarred the earth or polluted the water.

When we view the architecture of Mohenjo-daro we cannot fail to be impressed. Baked bricks were so well made and fired that they have retained their redness and hardness till today, and they are free of cracks, chips and cavities. The mortar for bonding the bricks was most often mud; mud-and-gypsum mortar was rare, lime-and-gypsum even more so. Yet parts of some walls still stand five metres high, decades after having been excavated! Buildings were constructed of a judicious combination of mud



Surviving house walls at Mohenjo-daro

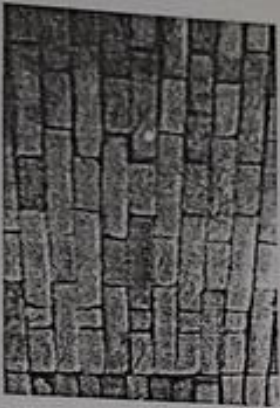
brick and baked brick, wooden beams and rafters for upper storeys or roofs, occasionally brick columns,¹ and thatch for roofing. Sun-dried mud brick and baked brick could be used in alternate courses in the same building.

The excellent condition of the walls is partly a result of the bond used by the Harappans in brick-laying, as also the thickness of the house walls. When walls are unbonded and the joints between bricks fall in the same vertical line down the brick courses, they soon collapse from stress. In contrast, a method that could be used to advantage, now called 'English bond', with headers and stretchers in



The wall on the right shows English bond masonry at Mohenjo-daro

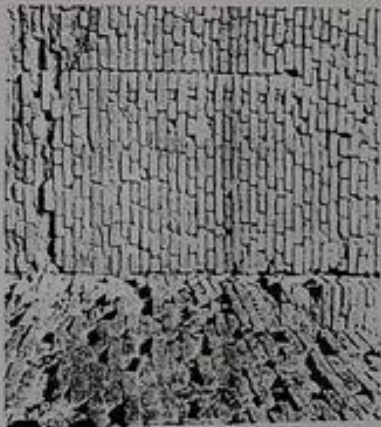
alternate courses, makes possible the staggered distribution of the load down a large area of the wall. It is thus one of the most efficient of bonds. A less strong bond, occasionally seen at Mohenjo-daro, is what we today call 'Flemish bond', with alternate headers and stretchers in each course.



Flemish bond masonry at Mohenjo-daro

¹ The Mesopotamians had developed the round column of appropriately-shaped bricks but the Harappans, who had access to tall and stout timbers, did not utilize these to a great extent.

Sometimes at Mohenjo-daro, the two walls of a house that make a right-angled corner did not interlock in their brickwork. While this must have made it possible to knock down one of the walls without damaging the other (when structural alterations or rebuilding was required), it would have reduced the strength of the structure.



The corner of a house at Mohenjo-daro where the two walls do not have interlocking bricks

Outer house walls at Mohenjo-daro were massive, 1.2 to 1.5 metres wide (or three to four bricks thick). They probably carried a first floor, as the remains of stairs indicate, and were shared by adjacent houses. Walls of even the smallest houses were solid brick, without rubble filling. Walls were often raised with one course of header bricks lying over a course of stretchers, as we have seen. In such a system, which would have made not only for strength but also quick construction, bricks of 40 x 20 x 10 centimetres make eminent sense, for the course of headers must be laid so that their centres lie over the joints between stretchers in the course below.² The architecture of a medium-sized town like Banawali is not greatly inferior to that of Mohenjo-daro, although only mud bricks were used here. These were of good quality and English bond masonry was known; house

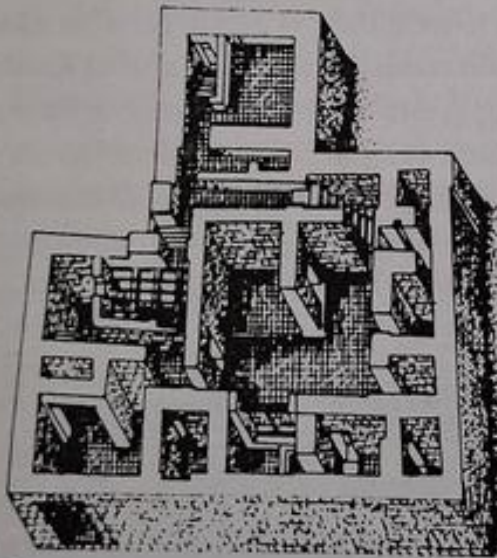
² Today the common brick size in use is 9 x 4.5 x 2.25 inches (say, 22 x 11 x 6 centimetres). Also, today we raise walls of only about two-brick thickness, because it is steel frames and concrete that provide the structural skeleton of a house.

walls were two or three bricks thick if not thicker and, at least on the citadel, were rebuilt up to four times.

In walls that still stand at Mohenjo-daro it is sometimes seen that ceiling beam sockets, about twenty-two centimetres square, were three metres above the floor (which is approximately the modern minimum requirement³) and spaced about a metre apart. Fragments of ceiling plaster, smoothed on one side, had reed-mat impressions on the other. Roof timbers were probably covered with planks, mats, beaten earth and thatch. Doorways could be a metre-and-a-half in width, spanned by wooden beams over two metres long, with the threshold consisting of wood laid over brick.

House form (mainly remnant ground plans) is an important source of information on social life. A house circumscribes the space within which a family lives and works. The distribution of activities (as indicated by fireplaces, grinding stones, grain- and water-storage jars, and craft production facilities) may point to the arrangements for cooking, eating and working. Whether these activities occur in the more inaccessible (private) rooms, for example, or in more visible parts of the house, can be instructive. On the whole, it was not until very recent times (following the Industrial Revolution) that people

went out of their houses to work—for centuries, work and residence combined in the same structure.



Plan of an 'average' house at Mohenjo-daro

The houses in Mohenjo-daro consisted of rooms spaced irregularly around one or more open courtyards, which were often paved with baked brick. They were imposing structures. The open central space would have provided light in the absence of large windows in the external walls. Dozens of wells have been

To a modern architect this ceiling height presents no technical wonder, as ladders and scaffoldings of suitable dimensions are easy to construct. Instead, the height correlates with, and reflects, room dimensions. A high ceiling makes no sense in a poky village hut.

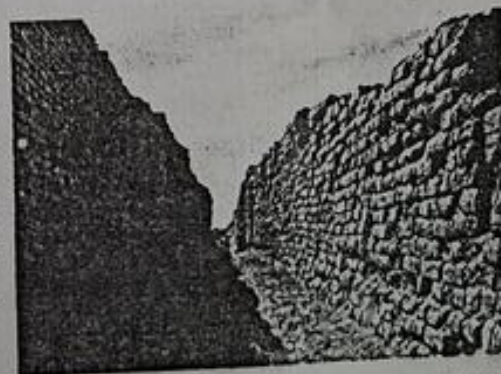
found in Mohenjo-daro and strangely, most of them are within houses (but near the entrances), not at street intersections or in any other open space (of which there are few). This makes us wonder whether the enclosed dwelling had the same connotations and functions as the modern house with its notions of the family and its privacy and exclusivity. Did the large houses accommodate nuclear families or larger social units? All we know is that cooking facilities, grinding stones (basalt saddle querns have been found in all levels at Mohenjo-daro), and the debitage (or industrial waste) of craftwork—often mark the courtyard as an activity area of the Mohenjo-daro house; and that, standing at the threshold, you could not look into the entire house. |

Brick was not the sole architectural medium. We have referred to the use of wood for roofs, ceilings and doorways. A dump of massive stones (limestone from Rohri) with circular cavities was found in the lower city. Each stone was about twenty-five centimetres high with the diameter of the inner vertical cavity being about sixteen centimetres. Mackay suggested that they were used as supports for wooden columns in the porticos of important buildings before they were dumped. Similar stone column supports occur on the citadel at the same site, and also at Harappa and Dholavira. At Harappa evidence has been found recently for the use of pairs of square wooden posts standing in a row along a wall.

The houses of Mohenjo-daro varied greatly in size, but



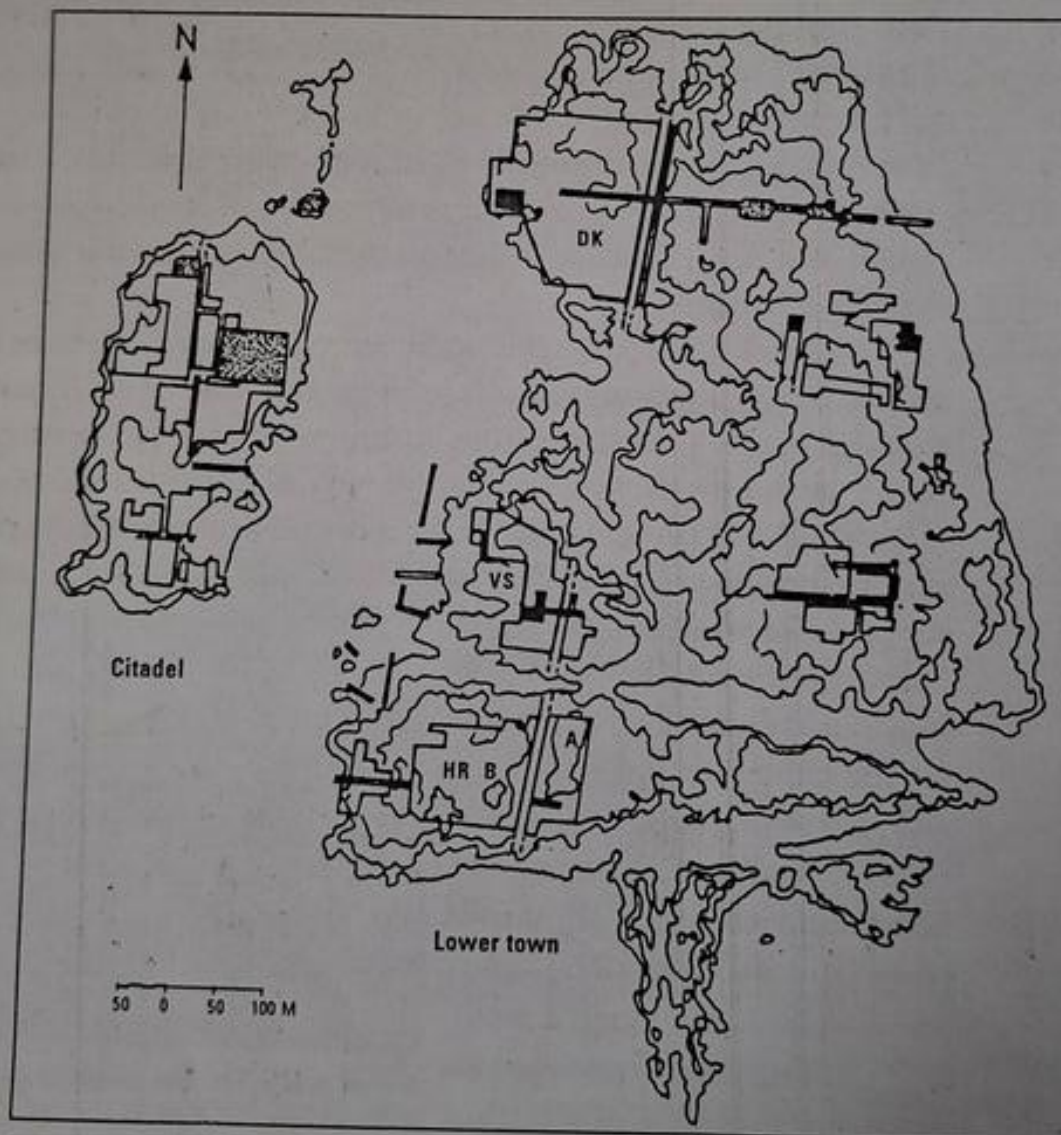
A well at Mohenjo-daro, whose brickwork is intact and is covered by a modern sheet of metal



A street running between straight house walls at Mohenjo-daro

the largest of them were not centrally located at the most accessible nodes, say, on main roads or their intersections. Also, there were no protruding porches, so that there was no transitional space or architectural unit between public street and private home. In that sense public and private space were sharply separated and we cannot but wonder whether there was any hustle-bustle on the streets or at street-corners, the streets seeming to have the limited function of leading from one point to another in the city. Perhaps crowds gathered and conversed and exchanged wares at the city peripheries. It is not improbable either that people conversed across the roof-tops of houses. For there are few open spaces to be found within the city.

Two separate sectors constitute the city of Mohenjo-daro, the citadel (about eight hectares) and the city itself (115 hectares or



Mohenjo-daro: site plan

Ruins of the citadel of Mohenjo-daro, viewed from the lower town. A Buddhist stupa of a later date crowns the citadel



more), separated by a space of about 150 metres which could have either taken a water channel or provided a green belt.

In Harappan archaeology the term 'citadel' is often used. A citadel is a fortress or castle adjoining a settlement which functions as a node of defence against the enemy from outside, as well as a facility where the local population can be held in subjugation. Citadels occur at some fifteen to twenty Harappan sites, large and small. That is to say, each of these settlements is formed by two distinct precincts, the smaller citadel being a higher place and often walled-in. At Mohenjo-daro, as we have seen, there is an appreciable space between the citadel and the main residential area; so also at Kalibangan and Mitathal. But at Harappa, citadel and residential area are more or less contiguous, and at Banawali the citadel is included within the town perimeter wall. At Lothal, the eastern edge of the citadel is flanked by the wharf of the dock basin. Let us consider the morphology of some of these places. (Some site plans are given in Chapter 2.)

View from the top of the Mohenjo-daro citadel





The Great Bath

Citadel buildings at Mohenjo-daro were elevated on platforms more than six metres high. The citadel was enclosed by baked-brick walls and towers. It would have been this part of the city that commanded attention. On it lay the Great Bath, the pillared hall, elite residences, and the so-called granary which we have mentioned earlier. Two buildings carry a feature called 'fenestration'. Around the small sealed tank of the Great Bath and in a courtyard of the so-called 'college of priests'⁴ we find that a wall which surrounds a rectangular space is, at regular intervals, open above the height of about

half a metre from the floor, as if there were a series of 'windows' at short intervals. The result is neither quite a wall, nor quite a row of pillars. If people circumambulated such a space in some kind of procession the visual effect would have been impressive. The Bath, constructed relatively late in the life of the city, is an outstanding example of Harappan brick construction in other ways also. The masonry is so skilled that the joints between bricks are only a few millimetres thick. Michael Jansen has calculated that its floor was levelled with great accuracy to the outlet in one corner, at a gradient of 1.4 to 1.7 in 100. While many courses of brick were laid in gypsum mortar, bitumen was also used. Bitumen or pitch was found near Sibi to the northwest, particularly useful for waterproofing. (It was, however, the product par excellence of Mesopotamia rather than South Asia, where its use was less frequent.)

It may appear strange that it was not the citadel but only the

⁴ The term 'college' used by the excavators has given modern students the mistaken notion that there was an educational institution here. What was meant by the term is a large building with courtyards and several rooms, that was a priest's quarter/precinct.

lower city of Mohenjo-daro that was constructed on a grid plan of parallel streets, wide plus narrow, intersecting other streets at more or less right angles. The reason could be that the entire citadel was one integrated unit, and that its several buildings were functionally inter-related. The Great Bath is the only known freestanding structure on the citadel.

A word on public architecture becomes necessary here because it reveals the best architectural skills and plans, and the labour mobilization and role of the elite of a society. In the Bronze Age we expect non-family residence structures to have had religious associations. But as will be discussed in Chapter 7, neither Mohenjo-daro nor any other Harappan site has structures that can be identified as temples. On the Mohenjo-daro citadel, however, lay the Bath that we have mentioned. It is remarkable for its constructional features and its fenestrated court but it is a small tank, 12 x 7 metres, though as deep as 2.5 metres. It could not have been meant for community immersions, as are south Indian temple tanks, which can be as large as 50 x 36 metres. The Mohenjo-daro tank had steps only in the middle of the two short sides, and presumably people entered at one end and exited at the opposite end. Perhaps it was a facility for water immersion rituals of royalty, e.g., the annual rejuvenation of the kingship in which the reigning ruler made a symbolic passage through the womb, or the cosmos, and thereby purified himself or reinvested himself with sacral substance. Other public ritual architecture may be identified on the Kalibangan citadel, which we will consider below. At Harappa, meanwhile, we come across residences and workplaces different from the average family dwelling. We have already referred to the pillared hall of Mohenjo-daro, a superbly paved structure, in Chapter 4.

As far as the lower city of Mohenjo-daro is concerned, it must have been a forbidding rather than an impressive place, unless there was a lot of carved wood frontage. Craft activity took place in several houses distributed over the city, large and small. A small area north of the built-up area was apparently a four-metre-deep garbage sump with broken pots, ornaments and tools, and ash and humus. The street drains probably carried away dirty water, not solid waste or excreta, as they are usually shallow and narrow enough to be spanned by one brick. They are fed by outlets from individual houses,



Street drain, fed by an outlet from a house on the left, in the HR area, Mohenjo-daro

mination from excreta and garbage gathering on the outskirts of the city.

Much has been written about the urban form at Mohenjo-daro, which was laid out on a grid plan. The grid was not one of symmetric rectangles, but excavation has revealed at least three major streets that ran more or less parallel to one another from north to south, each more or less nine metres wide and able to accommodate cart traffic.



Street drain

There were other streets, running west to east, perpendicular to these. So also, in Kalibangan, streets have been found that run parallel to one another in two directions, dividing the built-up area into separate blocks. At Kalibangan, as at Mohenjo-daro, the grid plan was maintained during several rebuilding phases.

It is not easy to decide what the Harappan city plan reveals. We cannot say that streets on a rectangular grid are functionally related to a street drainage system, for Kalibangan was laid on a grid but lacks street drains—there were, instead, jars embedded along the

and often drains that run down side streets in turn join the larger drains. The flow would have been maintained because regularly placed cess-pits would have caught the solids. Ultimately discharge would have been into the subsoil directly below or at the city's fringes. One cannot rule out the possibility that the source of drinking water, the city wells, would have been prone to conta-

edges of streets to catch the sewage from houses.⁵ It is also unlikely that the grid plan was an outcome of the necessity for wheeled bullock carts to move freely over the city. Further, the grid of wide and narrow streets does not give a symbolic form to the Harappan city, as the largest and best-built structures do not stand on the main streets or at their junctions.

The significance of the town plan may lie elsewhere. As we have stated in Chapter 1, the street drainage system was not the result of the endeavour of individual families but a civic, infrastructural facility. Planned streets made street drains possible, but at Kalibangan there were no street drains. The town plan reveals, instead, a preconceived township, planned at the outset, and hence a new settlement, or a community relocated from elsewhere (as was Jaipur from Amber in the eighteenth century, or Sirkap from the Bhir Mound, Taxila, in the first century). Also functionally related to a planned settlement are the uniform sizes and proportions of bricks: these would have been made in large numbers by several people under state or official supervision, rather than by individual householders. A last point we may repeat about streets in the planned cities of Mohenjo-daro and Kalibangan is that, vehicular traffic notwithstanding, they had no surfacing.

We know little about the beginnings of Mohenjo-daro, for its lowest architectural levels lie in a subsoil that is today waterlogged because of modern irrigation works. Sometimes bricks of an earlier level were removed to construct buildings in a later period, but on the whole later buildings were built directly on earlier ones. This is why the excavated walls are so high in places. Such a pattern did not exist at Chanhu-daro, where structures were built on totally different alignments from those of earlier (lower) phases.

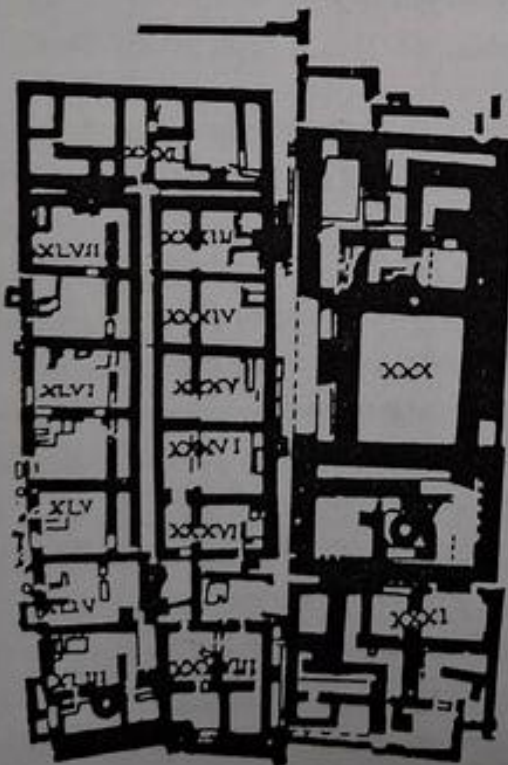
Let us now move to other places. At the site of Harappa (see plan in Chapter 2), mound F lay north of the citadel (mound AB), the latter built on an artificial elevation; the main residential area

⁵ At Harappa, too, besides street drains, there were large jars along street edges for garbage.

(mound E) spread to the southeast, and mound G was to the south of the latter. The residential area of mound E was enclosed by a wall of sun-baked bricks with corner towers and an entrance on the southeast corner. A wide street ran between the wall and the houses. Further afield lay the cemetery area. Mound F is of interest as it was the locus of a large storage structure (the 'granary'). This structure was built on a platform, and the wooden floors of the individual storage units (which lay in two rows flanking a paved corridor seven metres wide) were further raised on sleeper walls of brick. From the central aisle each room was entered by a flight of steps. (This building is based on totally different structural principles from those of Mohenjo-daro and Lothal, where wooden superstructures were raised on top of individual brick platforms. At Mohenjo-daro there were three rows of nine platforms, 1.5 metres high, with 0.8-metre-wide intervening passages. At Lothal there were eight rows of eight platforms, 1 metre high, separated by 1.2-metre-wide passages. (See the plans in Chapter 4.)

On Mound F at Harappa, Wheeler also identified two rows of 'barracks' and, to their north, five rows of round working platforms. Each of the fifteen self-contained residences/units called

'barracks' or 'coolie lines', in two rows, had an oblique entrance passage and, as stated in Chapter 2, the rich hoard of jewellery makes them more likely to have been the non-family residences of wealthy or important individuals. (There is a possible analogy at Mohenjo-daro. In the lower city there, two rows of two-roomed units flank a building with spacious courtyards and exceptionally thick walls. In a corner of its inner room, each unit had a bathing floor. These units are too few in number to have been barracks. It was suggested that they were shops, but



A non-family house complex at Mohenjo-daro

h bathing floors make this unlikely. Again, seals, faience and gold
ll artefacts rule out their use as residences of servants or slaves. This too
e may have been a kind of hostel, a non-family residence for visitors
to Mohenjo-daro.)

Harappa takes us back to the enigma of the citadels. Here, the storage building lay beyond the 'citadel' walls, unlike the situation at Mohenjo-daro. Very few structures have survived at Harappa because the site saw an exceptional degree of brick robbery in recent times. Wheeler excavated the perimeter wall of the citadel and found an embayment in its west side; he suggested that ceremonial processions were held, into the citadel. While citadels were visible and high places, they did not necessarily house the largest buildings—at Mohenjo-daro these were, we have seen, built in the lower, residential section.

Further, it is not quite clear why citadels were walled-in. At Harappa, for example, A. Kesarwani has argued, the wide north entrance without flanking guard rooms provides easy access and does not appear to be suitable for keeping enemies out. The same could be said about the north gateway of the citadel of Kalibangan. Flood protection is not always a satisfactory explanation either. One can hardly believe that the citadels at Dholavira and Surkotada required massive perimeter walls for flood protection! Citadel enclosures surely had a social and symbolic significance involving separation, exclusion and inclusion, say, separation of the elite from the ruled. We may recall that in the huge medieval urban complex of Vijayanagara (Hampi) the royal precinct was walled-in. This precinct, with more than one palace, lay within the 'urban core' that also contained residential areas, marketplaces and administrative structures, and was also encircled by a periphery wall.

It does not appear to be the case that settlement size determined whether or not a citadel would be built. For, while Harappa, Mohenjo-daro and Dholavira, the largest towns, have citadels, so do many other sites like Surkotada in Kutch and Sutkagen-dor, although they are only a few hectares in area.

There is yet another puzzle. When we consider the morphology of Kalibangan, a medium-size settlement, we find two clear units, each surrounded by a perimeter brick wall that takes the shape of a rhomb. The citadel to the west is higher because its structures

were built on the remains of an older habitation that had also been provided with a walled perimeter. The citadel is not very much smaller than the adjacent town. Beyond the two enclosed areas lie a ritual building with several fire altars, a possible pottery production area and craftsmen's residences, as well as a cemetery. The citadel itself has two parts, the north and the south, separated by a wall. The northern part had residential structures, presumably for the local elite, even though they were not raised on mud platforms. The southern area appears to have been utilized for public rituals (though this is not universally accepted). It consisted of several rectangular mud-brick platforms with flights of steps down one side of each. The structures built atop these have perished, except in one case, where seven fire altars with ash-filled pits and vertical columns, an embedded jar, and possible provision for ablution (and connecting drains) remain. Nearby is a well. There is also a pit lined with baked bricks, containing some cattle bones—the vestiges of a sacrifice?

The southern gateway to this 'ritual' precinct of the Kalibangan citadel is flanked by projecting towers with a baked-brick veneer; on one side of the towers, moreover, there are regularly-spaced post holes, presumably for setting into the ground wooden poles surmounted by banners. If this interpretation is correct, this was the public entrance into the ritual area. A paved path (of mud bricks) may, in addition, mark a processional way to this area from the northern section of the citadel. The lower town is constructed of mud-brick houses arranged around central courtyards; a brick trough for watering animals occasionally in the courtyard is, we have seen, on a sub-rectangular street grid. The streets are 1.8 to 7.2 metres in width.

Banawali lies upstream of Kalibangan in the Sarasvati-Ghaggar system, and is a somewhat larger site. Its perimeter wall marks out not a rectangle but a quadrilateral with curved corners. Its citadel was incorporated into a corner of the settlement at large; the citadel has a 5.4–7.5-metre-wide enclosure of mud bricks that is, on two sides, part of the city wall. In this medium-sized town there is at least one street of width over nine metres, that could have accommodated a two-way traffic of bullock carts.

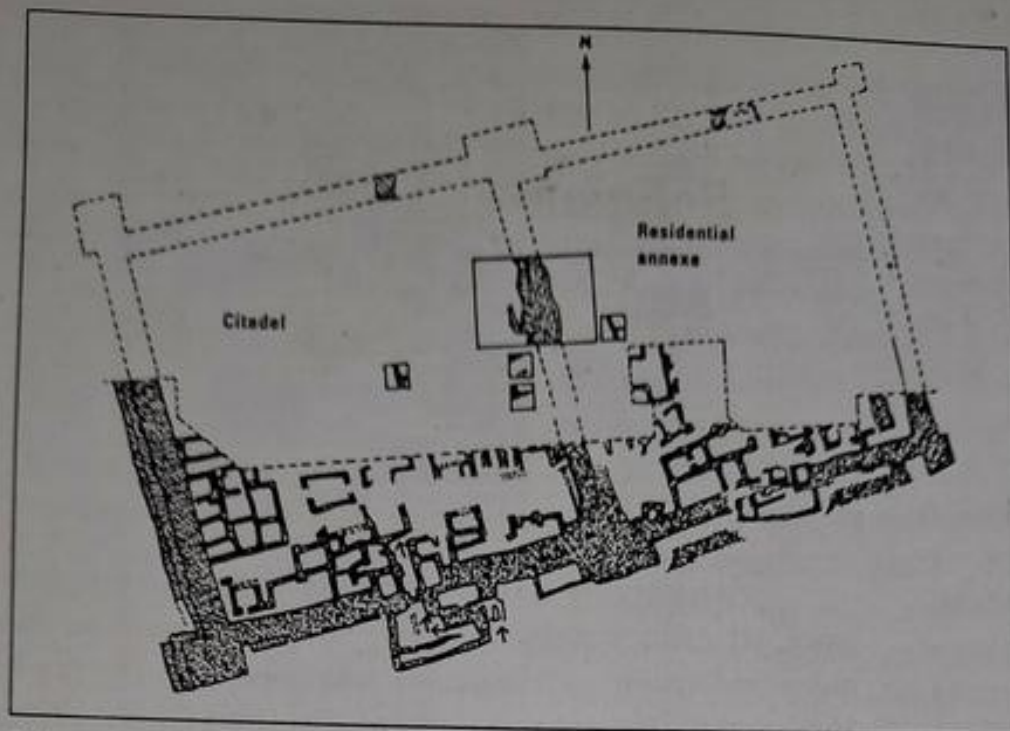
Lothal was also a rectangular town, and here too it is possible that some structures lay outside the mud and mud-brick town

enclosure, a wall more than fourteen metres wide. This wall has a battered outer face, and was not provided with towers or buttresses. No city gate has been found. Here, too, the citadel is not physically separate—it is a trapezoid area adjacent to which is a wharf and a dock basin. Citadel structures were raised to more than three metres on mud and mud-brick platforms. Some streets in the citadel may have been paved with bricks overlain by *kankar*. We have described the dockyard in Chapter 2, and the storage structure above. The latter, says Rao, was built so as to be under the ruler's (or local chief's?) direct control. In the residential area the widest streets were about thirteen metres across, and underground drains and cesspools often ran below these. There were water chutes in the foundation platforms to connect house and street drains, or else soakage jars were sunk along street edges for sewage and rain water. Here, as at Kalibangan, Harappa and Mohenjo-daro, since groups of buildings were raised atop platforms, the settlement was divided into several separate blocks of houses. Interestingly, occasional 'fire altars' are found on the streets in rectangular brick enclosures. There are craft production areas in the city with evidence of metalwork, textile dyeing, bead-cutting and heating, etc.

The Small Town

Let us now describe in outline the finds from Surkotada, to set off our knowledge of its larger and grander contemporaries. This two-hectare mound lies in eastern Kutch, near the western edge of the Little Rann, twelve kilometres northeast of Adesar. We had said that this is not the best location for an agricultural village. In fact, most archaeologists think that rather than a simple crop- and animal-raising village, this was a military outpost.

The settlement was confined within a rectangular periphery of stone rubble and dressed stone for the veneer, facing a mud and mud-brick core, and about four metres thick. Internally, a partition wall divides the settlement into two almost equal spaces, one of which has structures raised on a one-metre elevation of rammed earth and has been called the citadel. The projecting entrance to the citadel is a defensive structure: to enter one would have had to climb some steps, turn at a right angle and mount a ramp, and then turn again and climb steps into the citadel, where the actual entrance is



Surkotada: site plan

flanked by guard rooms. Inside, the multi-roomed houses are of either mud brick or rubble, with walls about half a metre thick (compared with walls well over a metre thick at Mohenjo-daro). At Surkotada there were obviously no two-storeyed structures. Street drains have been found. Outside the enclosed 'garrison' town lay a small burial ground in one direction, and in another, a locality where stone tools were made.

The excavator has pointed out that there was no way a bullock cart could have entered the Surkotada citadel through either of its gates. Yet, just two seasons of excavation here yielded 81 miniature clay wheels and sixteen cart-frame models. This is a large number if we consider that only 6 terracotta animals were found, and only thirty-four terracotta cakes. Other relative frequencies of artefact categories at Surkotada are as follows. There are 103 clay bangle fragments, but as many as 273 shell-bangle sherds. There are 115 long chert blades, and as many as 300 spherical stones, presumably missiles for hunting/warfare. While clay beads are numerically preponderant there are also steatite micro-beads, 113 carnelian beads, thirty of faience and seven of lapis lazuli. Surkotada has produced bone tools of several forms, points, awls, engravers and burins,

which is unusual for a Harappan site. There are fifteen saddle querns and about five whetstones; considering that querns are heavy and permanent fixtures in every household and not easy to carry away, we would have expected more of them in the upper levels of the site. There are less than 150 copper/bronze items, in contrast to 1200 at Kalibangan.

The graveyard at Surkotada contains pits covered by stone slabs, that in turn were surmounted by piles of stones. Within the pits were buried pots containing cremated human remains. This kind of secondary burial is not a common mode of disposal of the dead at Harappan sites, but it is a rule of thumb in anthropology that methods of disposal of the dead can vary independent of cultural or ethnic affiliation.

Several copper/bronze tools of the standard form, ornaments, plus a unicorn seal and a few stone weights were found at Surkotada. Another notable feature is that we would not expect elephants to have ranged anywhere in Kutch and yet a huge elephant tusk was found at Surkotada, as also a dozen *kajal* sticks and about a dozen other items of ivory—a reminder of the point made earlier about local communities being subsumed within pan-regional economic networks and movements of goods in the stage we call civilization.

Urban form is a subject that merits research. It is not only a matter of the presence or absence of street and house plans, or the outline of the enclosure wall of a settlement. The party walls we find at Mohenjo-daro raise questions about the interconnections between adjoining households and the use of roof space, but also about the provision of sunlight to individual houses necessarily from central courtyards. Was there a functional difference between houses that opened onto major streets and those approached by side lanes (and inaccessible by cart)? No one has to date suggested any such difference.

What were the factors that encouraged, or curtailed, social interaction (children's play, barter, conversation, mutual succour, the dispersal of information, or enactment of clan rituals, for example) between urban households? We can guess that the placement of wells in houses rather than on streets or public squares or other spots

with maximum accessibility, and the sharp boundary between domestic space and public area (in the absence of porches or verandahs), could have inhibited social interaction, although movement and conversation across roof-tops are a possibility. It is also an open question whether the shallow drains, either open or loosely covered with bricks or stones, sent out a stench in certain seasons. Did the generous provision of wells in Mohenjo-daro obviate the necessity of fetching water from the Indus, or were daily walks to the river necessary?

One wonders whether the conception of the city centred, as it did in Mesopotamia, on the brickwork, or whether natural elements like trees and pools or tanks of water were utilized for beautification as is the case with cities in the Ganga valley at the time of the Buddha. Today it appears, from what remains of the city houses, that the Harappan urban environment consisted of strictly functional and unrelieved brick walls, but for all we know the houses had decorated facades, perhaps carved wooden doors or roof enclosures. At Dholavira at least, clays of pleasing hues were used as wall plaster.

Last, urban form is important in that it is a clue to socio-political hierarchy and social barriers, as indicated by the height, enclosure, buildings and functions of the Harappan citadels.

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It is not easy to reconstruct the Harappan religion. In the first place, we cannot make a simple starting assumption that what we today understand as 'Hinduism' was to be found in the Bronze Age. Hinduism took centuries to evolve. There was the Vedic stage of sacrifice and elaborate ritual and the importance of the rhythm and sound of the chant, efficacious in itself. There were later inward-looking speculative movements that emphasized individual contemplation, mysticism and ascetism, with mutual influences to/from non-Brahmanic systems that were against animal sacrifice and concentration on ritual. Rgvedic deities like Soma and Indra lost their pre-eminent position too. The focus moved from the village to the forest, from community to solitude. The temple appeared only in the third century AD, in which period began the era of the Puranas with the incorporation of a host of deities and regional cults and sacred places. Then followed *Bhakti* and its rituals and ideology. When the Critical Edition of the *Mahabharata* was prepared earlier in this century, the project being to sift out or determine the core of the narrative (the earliest sections) from later accretions, passages about Durga or Ganesha were relegated to the appendices, as post-AD 300 interpolations.

It would thus be anachronistic to label Harappan double graves as *sati* burials or to search for caste segregation at Mohenjodaro. The elephant may have had religious significance in Harappan times but that does not mean that there was worship of Ganesha: Ganesha as we understand him emerged as a deity around the fourth century AD. Again, the famous seal from Mohenjodaro showing a horned personage seated on a stool in what we would today call



Horned personage surrounded by wild animals on a Mohenjo-daro seal

baddhakonasana, the arms covered with bangles, and flanked by small figures of the rhinoceros and buffalo on one side, and the elephant and tiger on the other, cannot automatically be labelled 'the prototype of Siva as Pasupati'. The Vedic *Pasupati* was lord of the domestic cattle herd, protecting cattle as they grazed; he was not associated with dangerous creatures of dense forests.

The main figure on this seal may,

instead, represent a holy person communicating with animals. (And in one line of thought it is a female and not a male personage.) There may have been continuous strands of religious thought and practice linking the Bronze Age with later centuries, but we cannot suggest that 'Hinduism' is discernible in Harappan pictorial representations. That would be an injustice to the rich history of Hinduism.

Modes of disposal of the dead may give us a few clues about ideas of death and the afterlife. The only actual evidence on hand is burials in graves or pottery jars in cemeteries, some incidences of post-cremation burial, and a few occasional 'symbolic burials' either in large pots or in graves, where corporeal remains are absent. It is not surprising that some of the population chose to cremate their dead, but we have no evidence about the frequency of this practice or the exposure of dead bodies to birds and animals. There may also have been immersion in rivers.

The dead were buried in graves usually with the head to the north and accompanied by an average of fifteen pots and, sometimes, joints of meat (animal or chicken bones are occasional finds in graves), which indicate the provision of food and drink for the netherworld. The pottery included lavishly-painted dishes on stand, S-profile jars and squat, bulging jars, and also unpainted jars, *lotas*, beakers and shallow dishes. There are also ornaments—but never in profusion—with dead persons. Tools are few, comprising stone flakes, *kajal* sticks, bronze mirrors and shell ladles. But there are no figurines or bead-making tools, no etched carnelian beads or weights

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v- with the dead. Surprisingly, seals, which we would think were marks
d of individual identity, do not occur with the dead. Either the dead
s were not expected to continue with their worldly duties, or the graves
e so far excavated are not those of the seal-owning Harappan elite.

Very few religious concepts, associations or beliefs seem to have been captured in pictorial depiction on the seals, copper tablets, figurines and painted pots left behind in the ruins of settlements. Amongst these we can look for the portrayal of deity-like entities, for example, figures wearing animal horns as mentioned above, or a particular iconography of human body and animal head, tail and hoofs, or a combination of animal and human torsos. As regards ritual itself, we can search for its architectural associations. In our world ritual is repetitive and formulaic action, with fixed sequences and procedures that become important in themselves.¹ It has particular associations with the cardinal directions, or inside/outside, or the vertical cosmic axis. Ritual commands attention.

Archaeological contexts like hearths, burials, cremation urns, the vicinity of wells, or crossroads are more significant for artefacts associated with ritual than garbage or general discard contexts (on streets, in rubbish pits, etc.). We could detect ritual buildings in the repetition of features like monumental entrances, location of entrances in a particular direction, orientation of corners or niches, and fixtures like benches, platforms or drains. Some aspects of Harappan religious practice would have been highly ceremonial and public, as at the Great Bath, but there would also have been domestic worship, as also local cults, village rituals enacted under trees,



Seal depicting a horned man-animal attacking a beast

¹ It is not essential, however, that all early religious ceremonials took a formulaic or fixed pattern. Dramatic sound and sights, or vivid symbols, or the togetherness of people could have been more important than a fixed sequence of action.

and so on. It is also necessary to consider the existence of shamanism in Harappan religion.

Let us begin with architecture. The plan of a house in the southwestern area of the city of Mohenjo-daro (HR-A, House 1) is shown here. It is of average size but it has a double entrance (rather narrow), and in courtyard 10 there is a brick circle of 1.2 metres diameter, which could have ringed a tree.



Plan of House 1, HR-A area, Mohenjo-daro



Personage in a tree surrounded by people and a large animal

On a few seals personages are shown in the branches of trees—were they tree deities?—and it is argued that an analogy may be drawn with contemporary practice in southern India where specific kinds of trees are planted in temple precincts and are associated with the temple god; these trees are cared for and seeds/cuttings of them taken to plant in other temples. Possible

tree guards occur on the Mohenjo-daro citadel. And on a few seals trees are shown standing in tubs or surrounded by enclosures. Further, early Buddhist art and testimony in the epics point to 'tree worship' in which offerings are made to the tulsi, pipal or banyan, and in which the tree deity may manifest itself in epiphany. Modern scholarship refers to such religious practice as 'folk cults'.

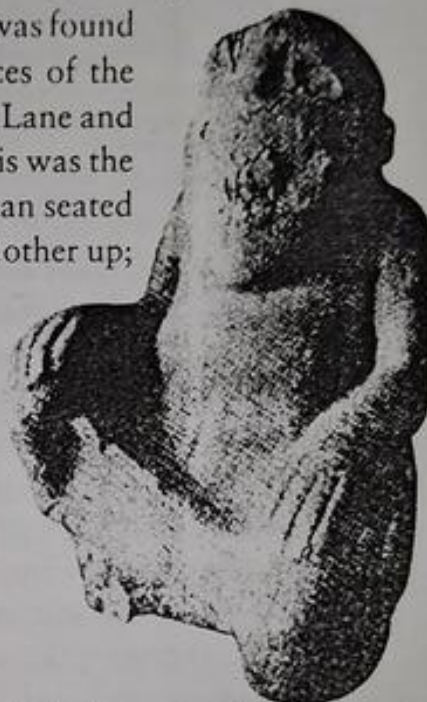
To return to House 1 in HR-A, on two sides of the courtyard two sets of exceptionally wide staircases lead up in opposite directions, which would not have been necessary in an ordinary house. Double entrance, double stairs and tree enclosure are unusual features. Yet these three elements do not co-occur repeatedly in several

buildings at this or any other Harappan site, to mark out 'temples'.² In fact, this house may be important in another way.

A glance at the plan reveals that House 1 was flanked by narrow lanes, one of which the excavators called 'Deadman Lane' because of a skeleton that lay there unburied. Another skeleton—of a rich man wearing ivory bangles and a faience neck ornament—was buried under courtyard 18 of the house (an unusual place of burial for the Harappan culture; the dead were generally interred in cemeteries). Part of a stone statue of a man was found in courtyard 10; and two other pieces of the same statue were found, one in South Lane and one in the house beyond that lane. This was the vandalized alabaster portrayal of a man seated with one knee flat and to the side, the other up; he wears what could be a ceremonial head-dress with two long pieces falling down the back of his head.



Stone head from a vandalized statue, Mohenjodaro, after M.K. Dhavalikar and S. Atre



Restored stone statue found in pieces in and near House 1, HR-A area

A second vandalized statue head was found in room 14 of House 1.

It appears that in the last period of occupation of Mohenjodaro a fairly affluent person living there was given a hasty burial, and stone statues were smashed. Incidentally, almost all the known Harappan stone statues depicting men come from Mohenjodaro (one has recently been found in Dholavira), **all are from the later period**, and all the dozen or so known statues were deliberately broken in antiquity. This makes us speculate that what we have here is

² In Mesopotamia, in contrast, temples were, like houses, made of mud brick and were not always particularly large buildings, but invariably had buttressed-and-recessed outer walls, which no secular building had.

not a temple but the residence of a politically important person, who was killed and hastily buried in a clash during which statues were also smashed. Were these the statues of deities? They have no horned head-dress. In some of them the hair of the man is worn in a bun at the back of the head, the top of the bun and the forehead being covered by an ornamented head-band. On seals this hairstyle is shown on male figures who hurl javelins. It is likely, therefore, that the statues depicted royal warriors, or the ancestors of a ruling lineage that was overthrown in the last days of Mohenjo-daro. Or else, in the late period a new practice had emerged that involved the carving and use of stone statues, and this was violently opposed.

Let us continue with buildings. The Bath on the Mohenjo-daro citadel is unique in the Harappan world. It is the only freestanding building of Mohenjo-daro, not sharing a party wall with any adjoining structure. We had referred to the steps that lead into the Bath at the two narrow ends and do not extend along all four sides, as in south Indian temple tanks, which are also twenty to fifty times larger. The fenestration around the tank has also been mentioned: standing beyond the fenestrated apertures, a person could observe anyone moving in the water in the tank. The nature and significance of bathing/ablution activity in the tank so constructed is open to conjecture, but it would certainly not have been for sport or mere pleasure.

Architectural provisions for public ritual were also detected in the southern divide of the citadel of Kalibangan, described above. The seven 'fire altars', cavities containing ash and terracotta cakes, with a clay column rising from the centre, the drain and well, and animal bones, indicate that ritual here may have involved the lighting



Ritual structure (?) in the Kalibangan citadel

of fires, ablution and animal sacrifice. We may note the occurrence of roughly similar fixtures at Amri in southern Sind, at Lothal, and at Nageswar. Details vary, for example, the shape of the fire pit and the nature of the column. Little else, however, can be said about these seemingly ritual fixtures.

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Many textbooks emphasize the 'Mother Goddess' as the central feature of Harappan religion. A change in perspective is, however, necessary now. In the first place, not every depiction of a woman needs to be of religious significance: there is no intrinsic evidence for labelling red-washed terracottas, like the one illustrated here, as a goddess, let alone a mother. Second, figurines portraying women are not as common or numerous as has been made out, even at Mohenjo-daro, where most of these were found. Third, this kind of schematic representation of a woman is not found at all Harappan sites: it is known in settlements along the Indus but is absent at Mitathal, Surkotada, Kalibangan and Lothal. Fourth, while these figurines could possibly reflect a popular practice in that the work is what would be called 'primitive' (in contrast to the modelling of stone heads of men) and the head-dress and hair are schematic and exaggerated, they do not occur in uniform archaeological contexts. Some were part of the garbage in the street jars used for urban disposal of waste or post-cremation urns, at Harappa. But they do not cluster near street junctions where trees could have stood, or in hearths, or near wells, and therefore it is not easy to suggest that their function was votive.

A somewhat neglected sphere of religion is the world of animals. We have mentioned the childlike quality of the animal terracottas in Chapter 5. Here it needs to be said that many of the small figures of animals have perforations. Either they were children's toys, or the perforations indicate that they were to be fixed on wall nails or carried on poles. Some animal figurines were placed in the post-cremation urns of Harappa, as were human figurines. Some were carved in shell and faience to be worn as amulets. More important, the overwhelming majority of Harappan seals carried a single animal as the emblem. The most frequently portrayed animal on the inscribed steatite stamp seals is a hybrid with one long horn that curves upward and forward (the seal-carver was quite capable of depicting two horns, one behind the other, on a beast). The length and shape of the horn, the lack of a hump, the long neck, the head looking straight ahead rather than down, and the ear(s) standing upright, are features



The 'Mother Goddess'



Unicorn and 'sacred brazier'

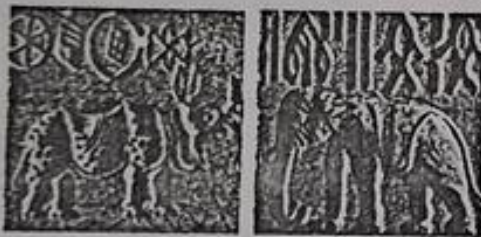


Different forms of the 'sacred brazier'

that indicate that this creature is not quite a bull, in spite of the cattle-like tail and legs. The most common (and important?) creature on the seals was thus probably a mythical beast. What this may signify is open to interpretation along multiple lines: it may

be important, for example, that on seal impressions the animal is almost always shown looking to our right, and that under the muzzle the 'sacred brazier' is very frequently depicted.

It is also of interest that other than the humped bull and the short-horned bull without hump (a bison?), the animals depicted on seals are wild animals—(unicorn), elephant, gharial, rhinoceros, antelope, tiger. It appears that wild and powerful creatures had a role to play in the symbolism of the seals rather than the domesticated sheep, goat, cats and dogs of the homestead that were part of the day-to-day life, understood



Wild animals (rhinoceros and elephant) on seals

intimately, and a source of nurture, while in their turn being dependent on people for their well-being. (These creatures are depicted in terracotta and faience, however.) Clearly, economic importance was not correlated in any simple manner with mythological and cultic significance. When we find, further, that the unicorn is not depicted in clay or faience, it could be asked what kind of conceptual distinction was made between the domestic and the wild, between the formal art of the expert seal-cutters and the seeming 'folk' art of the figurines. It may also be noted that wild animals play an important role in shamanistic religions.

Shamanism is a form of religious practice that exists among preliterate/prehistoric groups, including tribesmen and hunter-

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gatherers, as well as in the Shang-dominated society of Bronze Age China. Today it is especially prevalent in Central and northern Asia, and in the Americas. It prevails in systems of belief devoid of either a book or a priestly hierarchy.

Central to shamanism is animism, belief in the souls of animals, birds, plants or snakes, and a belief that these souls or spirits can communicate with living people. They do so through the shaman, a person with the rare gift of understanding them as he is able to journey into the world of the spirits—on the waves of frenzied drumming or clapping, on the spirals of smoke, or on the souls of sacrificed animals, by taking part in vigorous dance or by eating hallucinogenic substances. Shamans thus go into ecstasy or trance. While in the other world, they seek out cures for disease or drought. They are primarily mystics and healers whose powers are not acquired in this world but by crossing over into a world inhabited by gods and spirits. Such crossing transforms a person and gives him or her the power to heal—for it involves a new level of consciousness, a moving back in time to the primordial past or forward to the future.

The culture heroes of a society are thus often shamans who appear in the mythology after the disruption of a golden age, in which there had been no division between gods and people. The culture hero is sometimes a shaman sent as a messenger by the gods to help the people because they have lost the ability to commune with the gods or spirits. Scholars have found that ecstasy is an actual or sensory experience, an altered state of consciousness brought on by brain secretions which in turn are triggered by stress, trauma, fasting, or other physical conditions.

In such societies living creatures, including trees, are important. Snakes slither between this world and the netherworld, and birds soar from this world into the heavens. Once a shaman allows a bird or animal to take over his or her consciousness, he or she may prowl or prance or call like that creature. The shaman's helpers, incidentally, are often hybrid creatures.

There are hints of shamanistic practice on the copper tablets of Mohenjo-daro, many of which can be seen at the National Museum, Delhi, and the Mohenjo-daro Museum. These are small, very thin sheets of copper/bronze on which are incised, with small, sharp tools, standardized inscriptions (a spell?) on one face, and perhaps a



Symbols and writing incised on Mohenjo-daro copper tablets

masked figure with horns and clad in leaves/pelt, or an animal, on the other face. Were they protective amulets? Animals include the elephant, antelope, hare, rhinoceros, bull (with only one possible unicorn occurrence), plus some not easily identifiable ones. All tablets with the hare show the same inscription on their reverse. Unlike the other animals, the hare of the copper tablets is not found on the seals, though there are a couple of clay figurines. The leaf-clad figure holding a bow and arrow may be a hunter in leaf clothing that enables him to get close to his prey, or a deity, considering the horned head-dress. He may also be a shaman.

Material items which could possibly have an association with shamanistic practice and thought are ivory rods with dot-and-circle incisions (also called divination sticks by some archaeologists), talismans such as shell ornaments, drums depicted on one or two



Bronze mirror

seals, round bronze mirrors that 'open the way into the world of trance' (and which are used by shamans to 'see the future'), and cylindrical perforated jars in which certain kinds of wood charcoal may have been burned (some shamans inhale the smoke of burning fragrant wood to go into trance). Shamans have been known, in some places, to write their lore using a secret script. Some of the earliest writing in Bronze Age China, seen on cattle bones and turtle shells, recorded the prognostications of the ruler-shamans.

Consider, also, the seal which depicts a personage with horns and pigtail in a pipal tree (see illustration on page 106).³ Another personage kneels in front of the tree and there is the disproportionately huge figure of an animal with horizontally spreading and wavy horns. At the bottom is a row of figures each with a plait and horns and a tail and hoofed feet—masked dancers? The figure in the tree may well indicate an epiphany or theophany—a momentary manifestation—of the spirit/goddess of the pipal tree. As for the so-called Pasupati seal showing



The symbolic importance of the pipal leaf is evident on this seal

a person surrounded by animals of the dense forest, it is known that shamans often retreat to a forest to stay there in seclusion without food or shelter or clothes, in tune with nature, so that in time they are approached by several animals, one or other of which they will then take on as their companion/helper. Hybrid personages (human-animal)

³ It is of interest that no pipal charcoal or seeds have been found at Harappan sites; some naturalists believe that this tree was native to northern Bihar and not Sind. Today, near Harappa and Mohenjo-daro and in Kutch, the common trees we see are acacias, tamarisk and prosopis rather than the pipal. The beautiful pipal (the *asvattha*), in contrast to, say, the neem, has little utilitarian value and yet was important not only in Harappan decorative art but also for the early Buddhists in Bihar. Concerning the trees in enclosures that we have mentioned above, note also the depictions in early Buddhist art of tree railings and tree worship, and literary references to *caityas* and tree-deity epiphanies or manifestations, which scholars like V.S. Agrawala called a part of 'folk cults'.



Decorative elements painted on a pot (7)



are also depicted on Harappan seals and on the rare pot, together with birds, fish and some intriguing human figures with short hair that stands upright.

Was there a priest king? The archaeologist who finds an artefact-building often gives it a name ('priest king', 'dancing girl', 'college of priests') that can confuse generations of students and not-specialists. The bronze nude became the Dancing Girl because for the British excavators nudity meant lust—which in turn was associated with 'naughty girls'—and not because the girl is shown in any kind of dancing posture. So too the 'priest king' label for a stucco bust of a man with an elaborately embroidered/woven shawl over one shoulder. For the early British archaeologists the Harappan was a civilization contrasting in its paucity of weapons with contemporary Mesopotamia. Moreover, India was the Orient, the land of Religion; priest kings had to be more appropriate for earliest India than ruling dynasties. However, if there was a ruling elite—and it is difficult to see how such civilizational complexity could have come about without states and organization of the economy through state institutions, as with other Bronze Age civilizations—it could not have ruled through religious control alone. Religion and ideology are always the trappings or 'packaging' of the exercise of political power, they cannot be its source. Thus, in one sense, all Bronze Age rulers were 'priest kings' with heavy ritual responsibilities, but to suggest that Harappan towns and villages were ruled by priests and not kings would go against all the principles of early state structure as derived by anthropologists and historians.

8

The Bronze Age Social Formation

In this chapter an outline is presented of Harappan economy and society, and an attempt is made to indicate the logic of the socio-economic structure.

We have referred to western perceptions of 'Oriental' Indian society. For long a belief prevailed in Europe (and does even today) that the first human cultures and civilizations developed in Egypt and western Asia, but that from the classical period of Greece and Rome (from about 400 BC onwards), Europe came into its own. From then, it is believed, Europe saw a steady but dynamic development into the medieval period and then the capitalist era. Scholars like Karl Marx, inquiring into the absence of capitalism in Asia in the nineteenth century, thought the explanation was the stagnation of 'Oriental' societies after the first flowering of civilization,¹ and the particular importance of tradition and religion in these societies. It is in this intellectual context that we can understand the tendency to characterize Harappan society as a realm of religious control and priestly rule. Gordon Childe, for example, found the Harappan civilization to be unique in its lack of attention to weapons of war. Other scholars took this reasoning even further, questioning the existence of any kind of state in the Harappan civilization.

State-societies are controlled by ruling groups who order the labour of the populace and have special privileges as regards resources (land, mineral resources, or labour, and also the output of

¹ Gordon Childe, for example, found elite control over Bronze Age trade, manufactures, calendar-keeping and technology to be the factor that impeded discovery, invention, flexibility among the artisans and scribes, and hence intellectual growth and social change.

skilled craftsmen) and their distribution, which sets them apart from the rest of the populace, the ruled. It has often been remarked that the lower the actual economic power, the greater will be the ceremonial and status trappings of the rulers. They must be seen to be above the populace and imbued with religious authority or ritual efficacy. Ruling elites maintain their economic privileges because they exercise a monopoly over the legitimate use of force or coercion.

We do not, however, expect the earliest states to have had highly developed institutions for the exercise of elite power. For example, the institution of the standing army is a late development, contingent on the advent of coinage and the institution of wages or salaries for soldiers. So also, the taxation of production in agriculture can be advantageous to rulers only when mechanisms are developed to transport grain over long distances at reasonable cost (unless there is a land tax in money), and to record through archival practices the information that makes the calculation of tax and the registration of land ownership possible. As stated earlier, in Mesopotamia there are hundreds of clay tablets recording the mobilization of the labour of the populace for temple-building, the raising of city walls, and work like spinning and weaving in the temple workshops, but there is no tablet which records that kings demanded a proportion of the crop at the harvest. In early Egypt Pharaohs granted exemptions from compulsory labour to certain land allottees—this was not the same as land tax.

Correspondingly, it is wrong to assume that with the advent of the state there appears a bureaucracy in the true sense of the word. Bureaucracies are structures (hierarchies) of responsibility and command, involving the delegation of particular tasks to particular persons (that is, specialization of duties), archive-keeping, and a structure of differential wages, not feasible in the Bronze Age when societies had only recently broken through the limitations of tribal organization.

Yet, the existence of the state (or several states) in Harappan times is indisputable, however inchoate the administration and however personal the rule of the elite. In the first place, there is the testimony of developed urbanism in the Harappan area. We refer not only to the great size of some of the settlements, but also to the fact that in a place like Mohenjo-daro there are structures of a range of

ground plans and therefore functions, as also a wide range of exotic stones and shells and metals that came from near and far, plus hundreds of seals testifying to dealings amongst non-kin and, most important, a diversity of crafts (pottery, metalwork, faience, stone-ware, bead and shell industries). Second, there is the testimony of the street plans on which centres like Mohenjo-daro, Chanhu-daro, Kalibangan or Banawali were laid. Settlements can be laid out on coherent plans only if they are so conceived at the outset. No settlement that starts as a village, no old township, can gradually acquire a planned form. Thus, planned Harappan towns speak for settlement relocation and hence also for the movement of their populations. Besides, sustained urbanism (Mohenjo-daro would have flourished for a few centuries) is not possible in the context of a tribal economy as we have defined it in the opening pages.

We have referred to Harappan weaponry above. Metal weapons like arrowheads, axes and spearheads are not particularly sophisticated forms, as compared to counterparts in contemporary Iran and Mesopotamia. But there were stone maceheads for close combat, as well as missiles of baked clay.² Even if all the weaponry was of an inferior standard as a whole, this still does not rule out Harappan efficiency in warfare: much would depend on discipline, speed of recruitment and movement, and the efficiency of command and compliance. Nor should we expect a professional or standing army, as argued above, and the barracks that go with such an institution. The 'barracks' Mortimer Wheeler identified at Harappa are a small group of small dwelling units, too few in number to be associated with a battalion, let alone an army.

We had stated that all Bronze Age rulers would have been 'priest kings', in the sense that they exercised power from within the trappings of religious authority, but this does not mean that religion was a source of power: a ruler must enforce his decisions by the threat of use of force or, if necessary, by its actual use. However, students are often worried by the absence of Harappan palaces. The point is

² That the latter were regularly used in Bronze Age warfare is indicated in a Mesopotamian poem. In a passage describing the siege of a foreign and distant city the poem says, 'From the city darts rained like rain', and from its fortifications 'clay slingstones came clattering like hailstones in spring'.

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that we have no formula for identifying the architectural features of an ancient palace.³ While Mesopotamian palaces were huge structures with imposing defences, indirect access to the throne room, and storage rooms, perhaps it was the citadel at Mohenjo-daro that functioned as a palace-like entity, elevated and separate from the rest of the city, and providing residential accommodation ('the college of priests'), storage space, a place for public ceremonial (the Bath), and a place for petitioning the ruler or adjudicating disputes (the pillared hall?), while also functioning as a node of defence.

We can argue that the uniformity across Harappan sites of brick size and shape, pottery, chert blades, or copper/bronze tools, was not due to 'trade' in these items. Pottery and bricks involve high costs of transport, as mentioned above; trade in them would not be lucrative. Also, if such items were traded, there would have been varieties of them, according to their origin and the tastes of customers. In fact, in a Bronze Age economy we expect retailing (barter) to have played only a minimal role.

The uniformity of these artefacts is not explained either by the suggestion that there were multiple tribal chiefdoms that interacted amongst themselves. If that had been so, we would have seen more similarity in decorated ivory or gold items or etched carnelian beads—items of gift exchange or elite diplomatic exchange—than in artefacts of everyday use. The artefactual unity may have been, at least in part, an outcome of the labour mobilization that characterized all Bronze Age polities.⁴

³ Those who have seen the old palace by the Padmanabhaswami temple at Thiruvananthapuram will have noticed that it is a sprawling complex whose several buildings are almost hidden amidst trees. It does not stand high nor is it visually imposing. It is the use of different woods and techniques of decoration, and the artwork, that gives it its royal stamp. There is no starting assumption we can make about the forms of early palaces.

⁴ In Bronze Age Mesopotamia the rural communities owed the state periodic labour and the state recompensed those who worked in the temples and palaces with handouts of food and occasionally garments. Sources on Bronze Age China mention groups of people sent out to work in fields and at one royal centre a storage pit yielded about 3500 stone sickles, used and unused. The Shang rulers of China also used prisoner-of-war labour on a large scale. In Pharaonic Egypt expeditions were sent to the eastern desert to mine or quarry particular stones like amethyst. Thousands of people would be sent, and a settlement built and occupied until sufficient quantity of that material had been acquired.

Besides this there was, because of political unification, the development of a regional economy. It became possible for the produce of a few centres (the weights of agate cut at Chanhudaro, for example, or the stoneware bangles of Mohenjo-daro) to be utilized at other centres. The Harappan system of weights is, in fact, excellent testimony to the fact that political unification made for a degree of regulation of exchange activity. Prolific trade does not by itself prompt the emergence of a uniform measurement of weights—in the numerous city-states of Mesopotamia several weight systems flourished until such time as the land was brought under the control of the kings of Ur—unless an administrative authority enforces such a system. When there is political unification some erstwhile tribal settlements can afford to specialize in the resources of their locality, for state administration sees to the movement of goods even if the specialist trader is an institution not yet developed.

It was this kind of state economy that must have made possible the production of shell bangles on a seemingly larger scale at the small site of Nageswar than at Mohenjo-daro. Conversely, it cannot be the laws of conventional market economics that explain why prolific shell production should have been done at Nageswar at such a distance from the major centres of population (that is, consumption points). Nor can it be the principles of market economies that explain why the storage facility at Lothal in eastern Kathiawad, where only a few Harappan settlements are known, was larger than its counterpart at Mohenjo-daro, which was by far the more extensive site and situated in the midst of an area renowned for its agricultural productivity.

We have tried to explain above that the division of labour in Bronze Age society cannot be taken as specialization in the modern sense. Moreover, it appears, on comparison of the range of artefacts and materials of Mohenjo-daro with those of the smaller sites, that much of the non-subsistence economy drew on elite demand. This and the fact that so many of the non-agricultural productive activities depended on tools of copper and/or bronze that had to be procured—on state initiative—from afar, also means that the Bronze Age economy was inherently brittle.

Having said so much about the state, we should not forget that this state was built on a tribal foundation. One expects that

many tribal institutions survived into the Harappan period and in fact played an important role. Rural communities perhaps continued to acknowledge the distinctions of clan and lineage, as in contemporary Mesopotamia, where rulers record that they actually recruited warriors or temple-builders by clan and lineage. In Bronze Age China, the king could send out entire kin groups to found a new settlement and bring land under cultivation. Connected with the survival of clan and lineage distinctions is the absence of private property in rural agricultural land in the Bronze Age. Further, we cannot expect the bringing together of the entire Harappan area into one network to be a matter of coercion and state/administrative institutions alone. Rulers would have initiated and cemented relationships with various village communities through marriages, the bestowal of gifts, or by sending members of their own kin groups to reside amongst the various rural communities. It could be this phenomenon which explains why it is the unicorn, possibly a royal emblem, that is the most frequently occurring image (over 65 per cent) image on the Harappan seals.

The seal symbols are overwhelmingly single animals and there is no geographical pattern in their occurrence. In fact, most of them occur at the largest sites. So we cannot suggest that the animals represent either different towns/villages or different professions/guilds (there are far too many kinds of symbols to represent guilds). A likely interpretation is that the animals are the totemic, honorific emblems of various social groups, previously organized on tribal lines, in Harappan society. This apart, the fact remains that in the absence of a true bureaucracy the Harappan system would have depended greatly on interpersonal relationships.

Origins

In the previous chapter it was indicated that the earliest civilizations, which saw the emergence of states in one or other form, could not have functioned without dominance of, or the exercise of force, by a small section of society over the rest. Thus when we examine the development of the Harappan civilization, we do not expect that all its elements fell gradually into place, or that the culture acquired its form over the centuries by accretion. That would mean that its subsistence or craft production systems, for example, grew autonomously or by their own momentum. I would prefer to think that there were breaks or disjunctures, expecting hints of total change in some aspects of community life, even some evidence of violent happenings, although much would have remained the same for centuries since the pre-urban period. Archaeological evidence is about the long term. We deal with great spans of time as single units; moreover, material culture like pottery does not necessarily change with the coming of a new dynasty or with sharp political change, or even with radical change in human relationships. Through the vertical sequence of strata representing habitation in successive periods at sites, we see the forms of artefacts change, and this makes for an implicit paradigm of gradual, inexorable change in materials, techniques, technology—which has no room for people, motivations, calculations, or the coming into being of ruling dynasties.

If we consider carefully, it is not all that certain that everything 'evolves' over generations. Take, for example, writing. Traditionally *dhobis*, masons and potters use script-like marks to identify their customers or wares, and yet no system of writing has ever evolved from such usage. At Rahman Dheri near the Gomal

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Pass, in the pre-urban phase, marks like $\boxtimes$, $+$, $\boxtimes$, Z and $\checkmark$ were found on various pots. These marks bear some resemblance to signs of the Harappan script, and it was suggested that this was an early stage in the evolution of Harappan writing. It is, however, the contention of many linguists that writing either exists or does not; it cannot fall into place in bits and pieces. Moreover, these graffiti on pottery always occurred singly (at Harappa, too, it appears that there is only one case of three signs on a pot), whereas writing involves the use of multiple signs in changing combinations.

In our context, the major evidence for the sequence of development from the earliest village life to the beginning of the Harappan urban period comes from a single site, Mehrgarh, excavated over many seasons and with a unique thoroughness. Whatever the importance of Mehrgarh, can we ascribe the 'origins' of a pan-regional cultural phenomenon to the changes we detect in the sequence of strata at just one site? In any case, if for one excavator it is Mehrgarh that presents the developmental stages of the Harappan culture, for another archaeologist it is Rahman Dheri that holds the developmental stages, while yet another scholar believes that it is the earlier Kot Dijian culture that developed the ancestral elements. Whether individual material culture items (such as wells, bricks of a certain proportion, the usage of particular craft materials) can, by their presence or absence, provide the key to the 'origins' of civilization as we have defined it, is thus doubtful.

Let us now consider the early cultural development of the Indus region (Map 5). In this chapter we will sketch how elements of the economy fell into place but we will also mention the impact of agriculturist-pastoralist interactions, migrations from western Central Asia, the early flows of semi-precious stones but changes in the routes down which they moved, and shifts in other routes as well. We shall also find hints of intercommunity warfare and evidence for settlement interruptions. The role of metallurgy and control over metallurgical production, however, remains unexplored.

Mehrgarh lies on the frontier between Sind and Baluchistan. The lower Indus plain is primarily agricultural, but over much of the broken mountain terrain of Baluchistan it is animal-herding that has



prevailed over farming, which latter is confined to the narrow valleys of Baluchistan. Thus Sind and Baluchistan have always contrasted in terms of population densities. The Kacchi plain is a 'permeable frontier' in the sense that pastoralists from the mountains around Kalat, Quetta and Loralai, who need to move their sheep from the snow-bound mountain slopes, descend on the Kacchi plain in November with their tents and animals, and sojourn amongst the local sedentary agriculturists until about February. They return to the mountains in the warmer weather.¹ A parallel is afforded by the Dera Ismail Khan node on the Indus. Some herdsmen take the Gomal Pass from Loralai and Zhob to the Indus plains, and at Dera Ismail Khan can cross the Indus for access to places like Multan further southeast or Lahore to the northeast. Herdsmen are also known to take the Tochi Pass and enter the Bannu basin, to descend on the Indus at Isa Khel and cross the river to Mianwali. Thus Mehrgarh and the groups of sites near Dera Ismail Khan (Gumla and Rahman Dheri) and on the Bannu plain (Lewan, Tarakai Qila, Sheri Khan Tarakai, etc.) take on special significance.

The Kacchi plain is a frontier in another way as well. It lies on the eastern terminus of a major world route connecting Kandahar, Quetta and the Indus plains. The plants and animals domesticated by the villagers at Mehrgarh from about 6500 BC onwards are species less at home in monsoon India with its wet summers, than in the uplands of western Asia, Afghanistan and Northwest Frontier Province, and northern Baluchistan, with wet winters. Probably wild barley, for example, may not have grown much further east than Quetta. In Afghanistan the domestication of wheat, barley, sheep and goat appears to have begun early, say after 8000 BC. Perhaps some early herders, on their annual migrations with their livestock, found the Kacchi plain a good place to spend the winter (as do recent herders) and began to experiment with the cultivation of barley (which appears to have been the focus of agriculture in the beginning). Cattle

were domesticated subsequently in the Kacchi. Additional testimony to the significance of the location of Mehrgarh is its lapis lazuli, turquoise and sea-shell. Turquoise came from the Kyzyl Kum beyond the Oxus, or from northeastern Iran. Lapis lazuli is found in Badakhshan and in Chagai. The first is a very high mountain region and the second, a hot and very arid desert which also has copper ores. In the first period at Mehrgarh (seventh millennium BC) these blue stones were sometimes interred (together with bitumen-coated baskets—there was no pottery as yet—red ochre, joints of meat and flaked stone tools) with the dead, amongst whom were children. This indicates that the stones carried symbolic meaning.

It is also noteworthy that Mehrgarh stands not on the Indus alluvium but on a plain in which several mountain streams like the Bolan river divide into multiple branches and then dissipate into the soil, making possible a kind of wet patch cultivation. Also, small *bunds* could have been constructed across one or other branch, to make water available where it was needed. Possibly, this very early village also took advantage of its 'ecotone' location, its inhabitants having access to resources of the contrasting niches of upland and lowland.

The earliest farming village at Mehrgarh comprised small two- or three-roomed mud-brick houses with hearths, flaked stone tools of a variety of forms and functions in local stones, ground stone axes, grinding stones or querns and mullers, and many kinds of bone tools. Other settlements would appear in Baluchistan in the fifth millennium, and pottery was then to come into use there. Some early red and well-fired pottery of Mehrgarh shows similarity with that of Kile Gul Muhammad in the valley near Quetta. On the Gomul river, on the pastoralist winter route to the Indus near Dera Ismail Khan, a village was founded at Gumla. There were large pits here, five feet in diameter, full of ash, charcoal and animal bones. And the village of Mundigak, northwest of Kandahar, was, according to the excavator of Mehrgarh, settled by people from Baluchistan.

House construction techniques developed in the early periods at Mehrgarh. The earliest structures were made of long bricks with finger indentations. Later, straw-tempered bricks were shaped in rectangular moulds. Pebbles could be set in clay for house foundations but the brick, made of puddled clay set to dry in the sun in moulds,

ony is of particular value as a unit of small size that can be used in various combinations for different building purposes. Other than ordinary walls for rectangular houses, people here also learned to build retaining walls, terraces down slopes and buttresses as wall supports. They began to set roofs on rectangular-section rafters. Clusters of small cells were built in the second and third periods at Mehrgarh, where no kitchen refuse or everyday garbage was noticed. Occasionally yielding a number of polished bone awls that indicate the working of leather,² and surrounded by open activity areas, these were probably storage and workplaces for the tribal community. The cells are very small, often just a metre along one side, and can hardly be called the precursors of the huge storage buildings of Harappa and Mohenjodaro (a single hall in the Harappa granary was 82 square metres in area) which latter were, in any case, built on high foundations to keep the floors dry.

Beginning around or before 4000 BC, the third period of habitation at Mehrgarh yields stray pieces of copper, artefacts like a few seals, and copper-stained crucibles. A quantity of pots had been stacked near a kiln, suggesting the advent of the village potter. The village was now over fifty hectares in extent, very much larger than its contemporaries that lay in the Quetta valley, around and south of Kalat, at Sarai Khola far north on the Potwar plateau near Taxila, in Loralai and the Zhob valley, south of Bannu (the site of Sheri Khan Tarakai), and at Gumla. That Mehrgarh was the largest of the villages is not explained by craft production because all craftwork is not necessarily specialized work. Neither can we suggest that the Kacchi plain had the highest wheat and barley productivity of all the settled areas. Perhaps it was this plain that saw the maximum pastoralist ingress in the winter months, so that it was relationships between mobile herders and settled cultivators that provided the maximum scope for the development of new social institutions. One such social institution could have been the office of the chief, who managed inter-relationships between residents and herdsmen who came down from the hills with their animals for the winter. The seat of a developing tribal chiefship could have attracted a substantial number of residents.

² Perhaps cotton was not worn yet.

By this time many small villages had been founded also on the Indus plains, for example at Amri in the south on the right bank of the Indus, and at about forty sites around the medieval Derawar Fort on the now-dry Hakra. The many mounds on the Hakra have on their surface a range of ceramics, basket-impressed, black-slipped, appliqued, and so on. Ceramic forms include squat *handi*-type vessels. Hakra pottery occurs also at Amri, in the Bannu region, at Sarai Khola, and at the site of Jalilpur about five kilometres south of the Ravi and 65 kilometres downstream of Harappa. On the whole material culture comprised coarse and fine pottery, sometimes wheel-turned, ground stone and flaked stone tools, bone tools, baked clay figurines, and mud or mud-brick houses with cooking places. In this period lapis lazuli too has been found at some sites.

The Prelude to Urbanism

The next period, beginning around 3300 BC, is one of significant developments. In the high-altitude valleys there were by now villages of mud or mud-brick houses, occasionally on stone rubble foundations, large storage vessels, grinding stones, ground stone axes, a rich variety of flaked stone tools, and clay slingstones for hunting or warfare. Stone seals came into use. The villages of this period were four times as many as in the previous period. Many sites, including Mehrgarh, have yielded lapis lazuli and shankh-shell artefacts. Fine-textured grey pottery made on the wheel and with naturalistic motifs painted black, was fired at very high temperatures (950° C) under both oxidizing and reducing conditions. It occurs at



Fine painted grey ware from Mehrgarh

Mundigak, in the Quetta valley, in Zhob and Loralai, in central Baluchistan, and also at Mehrgarh. It was probably made at more than one of these places, which in turn speaks for an ease of interaction between various groups of villagers that made possible the transmission of a bundle of advanced ceramic techniques. There was also 'Quetta' pottery, light-coloured, buff to red, painted with geometric motifs. To place this pottery in context we must now turn to Turkmenia.



'Quetta' painted ware

In the small river valleys along the foothills of the Kopet Dag range, and later and further east in the inland delta of the Tedzen or Hari Rud river (which forms an oasis in an arid zone), after the establishment of agricultural villages (7000–6000 BC) there was gradual development until the Bronze Age (2500–2000 BC), when the fortified city of Altyn-depe flourished. As we have seen, the subsistence economy was based on wheat, barley, cattle, sheep, goat and pig, and later the camel, chickpea and grape also came to be domesticated. From about 4000 BC there was utilization of lapis lazuli and turquoise at these sites. Shankh-shell from Indian waters came into use later. Metallurgy was to involve a wide range of experimental alloys. The Bactrian camel drew two-wheeled carts. There were terracotta and bead-making crafts.

At one stage in the sequence, in the chalcolithic Namazga III³ period (3500–3000 BC), there appeared new forms of disposal of the dead (collective burials in round brick structures, partially under the ground) and a new polychrome pottery. The excavators began to think there had been an influx of tribes from northeast Iran. (There, the Gurgan valley has several prehistoric sites; it is situated on the frontier between the Eurasian steppe and its pastoral nomads in the north, the agrarian zone of Turkmenia in the east, and the Iranian plateau to the southwest, and has been repeatedly depopulated of its villages when engulfed by pastoralist movements out of the steppe.)

Whatever the truth of this inference, in this period there was also emigration from Turkmenia. All Namazga III period sites in the delta of the Hari Rud, except two, were abandoned. The delta was

³ Namazga-depe is the type-site for the Turkmenian sequence.

shifting eastward. Then archaeologists discovered the site of Shahr-i Sokhta, which marks the first settlement of Seistan around 3200 BC. This site lies on the eastern margins of another and much larger inland drainage basin, the Hamun-i Helmand. Forty per cent of the painted pottery of earliest Shahr-i Sokhta has unmistakable affinity with the painted pottery of the Namazga III sites of the abandoned Hari Rud delta. Moreover, compartmented seals found here also had strong affinities with Turkmenian seals. (A route running north to south along the present international boundary between Iran and Afghanistan was one favoured over the centuries by pastoralists because of the excellent pasture available along it.) It appears that migrants from Central Asia took the two-humped Bactrian camel with them, as the dung of a straw-fed juvenile was identified at Shahr-i Sokhta. Incidentally, Mundigak, northwest of Kandahar, also saw in the third period of its occupation this new pottery of Central Asian derivation, and the distinctive seals.

The two sites later took on urban characteristics, with Shahr-i Sokhta expanding to 150 hectares. Both centres were to develop extensive bead-making industries, with an accent on lapis lazuli. Map 1 shows that the lapis of Chagai was the most accessible to Mundigak and Shahr-i Sokhta. There are old pastoral routes which link these hills (which also have copper), to the region around Kandahar.



Seal from Baluchistan
found in association
with 'Quetta' ware

It was realized that the light-slipped painted pottery called 'Quetta' ware in northern Baluchistan was the same as the ceramics of the Turkmenian, Seistan and Kandahar regions, and as we had stated, for central and northern Baluchistan this was a period of a four-fold increase in the number of village sites. Thus it can be inferred that there was migration into the hill zone from regions to the northwest and west. Could this immigration have upset the fragile man-land balance in the area, which requires a judicious combination of agriculture and stock-raising, sedentarism and mobility? Were some routes of herdsmen disrupted? This is a reasonable conjecture.

In the period 3300-2600 BC there were significant interactions also on the plains, between the distinct cultures that had by now

taken shape: the Kot Dijian, the Amrian and the Sothi-Siswal. Few archaeologists have handled both the Kot Dijian as well as the Sothi-Siswal material—these lie on different sides of the international boundary—and to what extent the two are separate, or overlap, is not known to me. All portions of the greater Indus valley were now settled, from the Potwar plateau in the north to Amri in the south. In this period, too, the largest cluster of known sites lies along the now-dry stretch of the Hakra, there being thirty-seven downstream of the Pakistan-India boundary. The Kot Dijian pottery has the widest distribution, from Sarai Khola and Manda to the Hakra plain and the site of Kot Diji itself, and as far west as Makran. Kot Dijian pottery is being excavated at Harappa and is also known in the Bannu basin (Tarakai Qila) and in the Gomal valley sites of Gumla and Rahman Dheri.

By this time the subsistence base of the Indus civilization was in place. Wheat, barley, lentil, peas, sesamum, linseed, dates and grapes were being cultivated. Sheep, goat and two kinds of cattle are attested. Most important, the surface of a ploughed field was sealed under Early Indus habitation layers at Kalibangan, as noted in Chapter 2. As cross furrows were visible, we can infer that two crops were raised in the field, which is good evidence for intensive agriculture. Early Kalibangan testifies to an appreciable utilization of copper in the Sothi-Siswal culture, as far as we can make out from preliminary reports (the excavation report not having been published). People of this culture probably anticipated the Harappan norm of brick production and brick-laying. There was only occasional use of baked brick, however, and the walls were not as thick as at Mohenjo-daro. Deep storage pits lined with chaff-tempered plaster are a characteristic of Sothi-Siswal sites, and so too baked clay bangles that are joined, and terracotta beads of a truncated bicone shape.

In other early cultures, toy wheels in baked clay are in evidence, and cart-wheel ruts have been found at Harappa in very early levels that produced Kot Dijian pottery. But there are no early period depictions of river or sea craft. Seals were in use at sites like Mehrgarh, Harappa, Lewan (Bannu district) and Rahman Dheri, and in the Quetta valley, but we do not know if they were used for sealing merchandise; many early peoples in western Asia utilized seals for securing the doors of their houses. In the last two phases of Mehrgarh



Early figurines (C. Jarrige)
at Mehrgarh

occur very large numbers of terracotta figurines of women with tapered legs, elaborate hairstyles and exaggerated breasts. At Kot Dijian sites, squat red-brown jars with very short necks sometimes carry a black painted horned head. The woman-snake figurine is characteristic of Gumla, and the figurines of Sheri Khan Tarakai are again different.

Where crafts are concerned, before the urban period there appears to have been only a modest use of copper/bronze at settlements like Mehrgarh. Metal was used for bangles as well as rods or awls and the odd chisel. These were cold-hammered or cast in open moulds; there is as yet little evidence for closed (two-piece) moulds or lost wax casting, or for soldering. Only a few gold fragments occurred at one or two sites in the early period, which to my knowledge used no silver either. Possible ivory bangles at early Amri, one carved ivory 'seal' at Rahman Dheri, and one elephant tusk with grooves at early Mehrgarh do not constitute adequate evidence for the development of the ivory-carver's craft.

Steatite was in use in this period and the beginnings had been made of baking and glazing and the use of steatite paste. Shell was certainly in use but not on the scale of the later period, and

not for the range of ornaments (bangles, beads, pendants) and inlays of that later period. Bead-making had begun, as also the use of the blue stones and the stone drill for perforating beads. Faience is possibly attested at Kot Dijian Sarai Khola. Carnelian, the hardest of the stones used, appears to have been shaped into long barrel beads and etched with geometric designs only in the Mature Harappan period. As for cotton cloth, it is attested at a few Mature Harappan sites and there are varieties of spindle whorls at most of the sites. But in spite of a mass of charred cotton seeds, no spindle whorl is reported at Mehrgarh, only bone awls for stitching leather. At Sheri Khan Tarakai a single baked clay spindle whorl occurs⁴ and Tarakai Qila has a sealing with the impression of some fabric, not necessarily cotton.

Thus, as far as present evidence stands, there was an appreciable increase in the scale and skills of craft production in the Bronze Age (the Mature Harappan period), while in the sphere of subsistence and some house-building methods,⁵ or in the use of terracotta cakes and terracotta and stone missiles, some elements of the Harappan pattern had already appeared.

Discontinuities of other sorts can also be perceived. Perhaps in the earlier period seats of tribal chiefships had emerged, marked by stone or brick fortifications. Early Kalibangan (over four hectares), Banawali and Rahman Dheri (twenty-two hectares) were the larger of the fortified places. (Obviously Mohenjo-daro and Harappa were on a different scale altogether.) Kot Diji too was surrounded by a wall. A non-domestic structure with buttressing is known at early Mehrgarh. It is intriguing that Mehrgarh and Rahman Dheri, the largest and richest sites, have no subsequent Harappan occupation. It is as if the Harappan elite avoided the old centres of tribal eminence and influence, and sought to establish new seats of power.

Significantly also, the uppermost stratum at Rahman Dheri, yielding shell, metal, lapis lazuli and carnelian, dates about 2500 to 1900 BC but remains Kot Dijian in material culture. Further, at Nausharo near Mehrgarh the Kot Dijian level I is capped by a burnt stratum containing ash, debris, charcoal, and broken or reddened bricks.

⁴ In contrast, at contemporary Mundigak there are hundreds of baked clay and disc-shaped spindle whorls.

⁵ In the earlier period, however, there were no clerestory courtyards or thick-walled two-storeyed structures or pillared halls.

During that period structures had been built on massive platforms and there were terraces in series. The late Kot Dijian village at Gumla, with the odd Harappan weight and etched carnelian bead, is overlain by a mass of burnt material and smashed walls and pottery. At Kot Diji too it appears that the entire Early Harappan settlement was burnt down. True, all burnings need not be due to military destruction but the coincidence of burnt levels and late Kot Dijian occupation at more than one site is perhaps noteworthy. Meanwhile, at Sarai Khola the Kot Dijian strata are 'sandwiched' between sterile layers showing absence of occupation. We do not know what caused these discontinuities, but at least we can rule out long traditions of rural stability and sustained habitation history as having contributed to the development of Bronze Age institutions.

At Amri, Kot Diji, Gumla and Kalibangan, where Early Harappan material is stratified below the Mature Harappan, the change was marked also by an 'overlap' of earlier (local) and Harappan ceramics with or without signs of violence/destruction or desertion preceding the Mature Harappan. This means that none of the earlier cultures was transformed into the Mature Harappan. The same, incidentally, can be said of local village cultures in Gujarat which may pre-date the flowering of the Harappan culture.

The sequence on the Hakra plains also exhibits discontinuities. The Early Harappan sites lay between Fort Abbas and Yazman. Five of them were more than ten hectares in size (Jalwali was over twenty-two, and Gamanwala over twenty-seven hectares). But of the thirty-seven sites only three continued to be inhabited in the Mature Harappan period—Sandhanwala (ten hectares) and two very small sites. In this zone, in the Mature Harappan period there were 83 habitation sites (as also some camp sites and several brick- or pottery-manufacturing places). The total area of habitation for the earlier and later periods shows a great contrast, 210 versus 450 hectares, which is a more than two-fold increase.

Many Kot Dijian sites like Rahman Dheri show no Mature Harappan occupation and continued to be occupied after 2600 BC. Thus it is not impossible that there was a political reason why Mature Harappan settlement did not proliferate in the plains of northern Punjab.

Just as Mehrgarh and Rahman Dheri saw no subsequent

Harappan occupation, neither did most villages of northern and central Baluchistan. Communications down the Bolan route to Kandahar also appear to cease, with no perceivable links between Mundigak and Harappan sites. It is as if a frontier were closed, as we have argued above. While there were, in the earlier periods, stone bead industries at Shahr-i Sokhta and Mundigak, these now (in the period contemporary with the Mature Harappan) ceased. In the last period of its occupation Shahr-i Sokhta shrank in size. Meanwhile, in the Mature Harappan period, Shortughai was founded below the confluence of the Kokcha and Oxus, not very far from the lapis-bearing gorge of the Kokcha.

In summary, what we have found is some continuities in basic economic and technological aspects, together with a new range of crafts, perhaps made possible by regular access to bronze as a material for craft tools. Settlement history was not smooth over the two periods. Besides, we find that Mature Harappan sites range in size between 125 hectares and less than one hectare, the majority of measured sites being six hectares or less. The mean averages to something between seven and ten hectares. This is a true settlement-size hierarchy and reflects the play of complex economic and political forces, over and above agricultural potential. We also see that world routes to the Indus plains from regions west and northwest changed radically between the Early and Mature Harappan periods. So too, lapidary industries could have shifted location, and new sources of blue stone come into use. And it was only in the latter period that there appeared city life, writing, a uniform weighing system, regional specialization in crafts (e.g., long chert blade production, weight manufacture, shell-bangle cutting), industrial sites (separate brick- and pottery-baking places), and maritime ventures to the Gulf and Mesopotamia. In the Mature Harappan period, local or regional culture traditions lost their distinctiveness as the metropolitan material culture engulfed the regions.

However carefully the development of material culture is traced through the sequence of strata at individual sites, 'origins' are not amenable to straightforward archaeological interpretation. In the first place, the archaeologist must define the phenomenon whose

Early Pottery (various shapes)



Aurika

Sethi-Siwali



Kal Ojhar

Origins

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origins are sought. Civilization is not reducible to pottery styles, bead perforation methods, brick size, crops and shell bangles. Nor can we ever identify the ethnic origins or affiliations of the Harappan ruling elite or the various groups that constituted the populace. To ask whether 'the Harappans' were local people or outsiders is invalid. It was economic transformation, and the political and social institutions that had developed, that constituted the emergence of civilization. Thus in interpreting the processes of the emergence of civilization we have to make a conceptual and analytical leap from material culture residues to social institutions. This is a far from easy task, and in this context archaeologists have not yet spelt out the limitations of archaeological data.

Some would suggest that the production of a subsistence surplus was the key to social stratification, but this is hard to support. We cannot go into a full discussion here, but if 'surplus' is conceived as output over and above what can be consumed—which is a faulty definition—the question would arise why any society should produce unnecessary quantities of food. 'Surplus' is instead an aspect of distribution, and the problem is what gave some people the right to the produce of others.

There is the question of metal, whose importance we have stressed in our conception of the Bronze Age and whose presence we have traced in the formative stages at sites like Mehrgarh. In what way is metallurgy a 'cause' or a 'starting point'? The Kayatha culture in Malwa and the north Rajasthan Ganswar-Jodhpura culture had respectable metal industries, but never saw development into an urban, literate culture stage. If technology, then, is not the 'engine' of social evolution, finding technological advances in the archaeological sequence is not tantamount to describing the development of civilization. Technology, far from being an independent variable, is rooted in society and economy, and the development of craft skills would have proceeded in tandem with the emergence of elites, the development of their organizational abilities, and the ways in which they manifested their power and social status. The division of labour, likewise, would not be the outcome of autonomous economic growth. We have no means of finding out whether certain kin groups or dynasties were able to exercise power over others because they were in some way able to control the flow and use of copper and

tin in terms of organization and technological expertise. Such control would have given an advantage in warfare and in the production of status craft items or items for export, also making possible cart construction and shipbuilding on new standards.

The Harappan civilization had far-reaching contacts overseas, all the way to southern Mesopotamia. For all the sequential stages in agriculture, house construction, pottery-making or ivory-cutting that we may claim to have uncovered, we have no adequately excavated coastal site of the antecedent period except Balakot, and here sea resources do not appear to have been utilized as extensively in the initial period of settlement as in the Harappan period. The pre-Mature Harappan cultures of Kutch and Kathiawad and mainland Gujarat await full investigation. These are detected at early Dholavira, in burials at Nagwada, at earliest Padri south of Bhavnagar, and a few other sites. But we have not as yet uncovered fisherfolk or coastal communities dotting the coastline of Kathiawad in the centuries before 2600 BC. There are only stray sites like Prabhas Patan. (Padri was located a couple of kilometres from the sea-shore, but apart from an unusually large copper/bronze fishing hook and some fish bones, it gives no evidence for a sea-oriented economy.) The same may be said of the coast around Karachi, and the Makran. From where, then, did the Harappan culture-complex derive its boat-building technology and its skills and traditions of sailing, navigation and land-sighting?

The End of the Harappan Civilization

We cannot suppose that the authors of the Harappan civilization, meaning its rulers, shamans, craftsmen, shepherds, tillers of the soil, shipbuilders and seafarers, actually disappeared or became extinct. What disappeared was the coherence of the civilization as an overarching system, with its regional crafts, modes of elite control and systems of long-distance procurement of materials. The erroneous idea that the population ceased to reproduce is largely due to the nature of the archaeological evidence, namely the large-scale abandonments of Harappan cities, craft towns, garrisons and villages. Mohenjo-daro was abandoned, and Harappa saw squatters living in abandoned houses or removing bricks from structures to construct rude shelters, and using the cemetery for their own burials. Ganweriwala, Dholavira and Rakhi Garhi, the other large settlements, were deserted. On the Hakra stretch, of more than 80 habitation sites, only one small village has continued occupation into the next, 'Cemetery H', culture period. This culture is attested at about twenty-eight (new) settlements in the Hakra plains. The total settled area in this region fell to less than half the Harappan settled area. Did the inhabitants shift to pastoralism, or did the villagers migrate upstream to lands with more reliable ground-water resources?

Because of the large-scale desertions, scholars have been led to infer that some kind of holocaust or natural calamity, or a catastrophic event like a supposed Aryan invasion, brought about the end of the Harappan civilization. This kind of interpretation is somewhat simplistic, but before dismissing it let us consider the arguments for floods and for climatic change.

Sind has suffered serious floods through history, as we have

seen. Fifteen exceptionally destructive floods in the course of one century are not uncommon. But the 'flood theory' argues for exceptional floods, caused by earthquakes. This region is prone to earthquakes and in 1818, for example, there was a major upthrust of the ground at Sehwan downstream of Mohenjo-daro and upstream of Amri and Chanhudaro. This pushed the Indus river water back and a gigantic lake was created for about two years. It is this kind of phenomenon which is envisaged as being responsible for the end of Mohenjo-daro, although it is also known that rural life resumed its rhythm a few years after 1818. Another problem with this theory is the absence of definitive evidence for third-millennium floods. What some archaeologists took to be deposits laid by still water on the southern edge of Mohenjo-daro, is now believed to be the remains of mud platforms. (The two are not always easy to differentiate.)

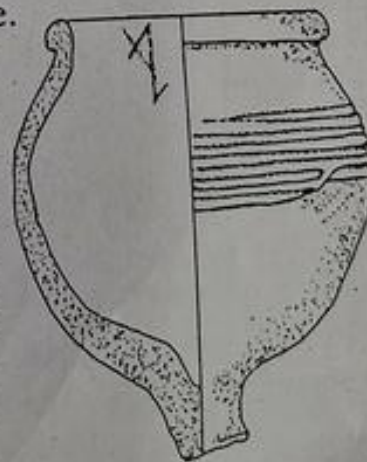
We have seen earlier that the evidence for climatic change comes mainly from pollen in the Rajasthan lake deposits. This evidence prompted an inference that there was more winter rainfall in Harappan times than later, and that the summer rainfall was appreciably higher. But when did the rainfall begin to decrease? We cannot assert that dessication—if any—began precisely in the last decades or last century of the Harappan period. Climatic changes are not dated with calendrical precision. Indeed, it was initially stated that around 1800 BC, which is the approximate terminal date of the civilization, rainfall was exceptionally good. Many also doubt whether the pollen evidence can indicate the magnitude of change in rainfall. The palynologists' conclusions were that agriculture began in western Rajasthan around 7000 BC, but no neolithic or chalcolithic sites of such early times have been found by the exploratory expeditions conducted in that region.

An important additional point that needs to be remembered is that climatic change in the strict sense is a world phenomenon, and that several Bronze Age civilizations weathered the environmental crises, if any, without collapse in the early second millennium BC. The Mesopotamian civilization, in spite of westward shifts of the channels of the Euphrates, soil salinity brought about by canal irrigation, and repeated invasions and immigrations of pastoralists from the desert, retained its language, writing methods, literary forms and texts, pantheon and temple architecture, well into the late first millennium BC,

while there were changes in the social and economic structure.

Not all environmental change is a matter of rise or fall in annual rainfall. Local changes in the flora and fauna of particular areas can be brought about by overgrazing and steady consumption of large amounts of charcoal as fuel for brick-firing or metallurgy. The only systematically argued hypothesis about environment was formulated decades ago by Walter Fairervis. It remains a model study, even if we do not agree with the details. It takes into account the natural resources around Mohenjo-daro (soil, forest, pasture) and calculates the food requirements of the estimated population of the city. The estimated food requirement is used to calculate the acreage under crops in any year in the region around Mohenjo-daro. This in turn enabled Fairervis to estimate the number of cattle required for tillage and hence the total cattle population. He found that the cattle could not have been stall-fed, so that free-ranging would have been necessary. The scale of free-grazing by cattle, he concludes, entailed a 'formidable assault' on the natural vegetation of the locality. Even if the population and cattle estimates need to be revised, Fairervis laid down a valuable principle of ecological history that points our search to paths other than sudden and natural calamities. Let us take note in this connection that the population of Larkhana town near Mohenjo-daro, as late as the nineteenth century, was less than 11,000. This figure is lower than the most conservative population estimate for Mohenjo-daro. Perhaps certain nodes on the landscape were 'overpopulated' and, over the centuries, depleted of their natural vegetation. This kind of reasoning sees people and their actions as responsible for their fate, though it cannot be an adequate explanation for total civilizational collapse.

In this last context the later history of Mohenjo-daro is relevant. It is marked by signs of trouble. The structure of the finely-paved pillared hall was altered; the granary went out of use; shell-cutting was done in the northern citadel area; kilns encroached into the northern residential area. Here, two sizes of brick were now used haphazardly for the same wall and were laid without precision. Scored goblets, roughly made on



Scored goblet

the wheel and shaped so that they could be tied with string, are found by the dozen in the late levels.¹ Occasionally seal-impressed, their contents could possibly have been standard amounts of handouts (flour?) to the populace. Several massive limestone column bases were gathered together in one room of a house in the lower city; the excavator suggested they were gathered there 'after the final desertion of the city', with the intention of removal.

That times were uncertain and strife/warfare/invasion was feared, is also indicated by jewellery hoards cached away under house floors in the last phase of Mohenjo-daro's existence. Not all hoards are indicators of uncertainty; for example, in the northern area of the city we find a hoard that could have been a metallurgist's working material. But caches with gold, strings of etched carnelian beads, silver foil, a silver lump and bracelet, jade and long carnelian beads do appear to be family treasures that were secreted away under floors, and for some reason never recovered by the owners. We do not know if it was hill people from the Kirthars, or enemies in the plains, or local rebel factions, whom the rich had feared. The head of the 'priest king' seems to have been broken and to have fallen, together with a wall, into a passage. We had referred to other dese-



Headless (vandalized) stone statue of an animal

crated sculptures earlier. The archaeological contexts of such pieces speak for internal dynastic feuds or ideological confrontation in the last days of Mohenjo-daro.

It needs to be emphasized that desertions of sites are not easy to 'read'. The archaeologist can tell that there is no post-Harappan culture at a particular site, but is rarely able to differentiate a quick total abandonment from gradual, house-by-house depopulation of a village over, say, a generation or two. And the two are very

¹ G.F. Dales found that this kind of pottery is late in the history of Mohenjo-daro. It occurs also at Harappa, but not at many other Harappan sites. Because such pots occasionally carried a written message, they may not have been made for simple drinking purposes; instead, their content required some kind of official stamp or guarantee. The question then arises, why did the authorities need to utilize mass-produced pots of standardized capacity?

different kinds of abandonment, with different causes. Some abandonments may have occurred during the Harappan period, others after. We can only predict that if abandonment is quick and caused by calamity, the fleeing population will leave behind jewellery, wooden doors, or heavy grinding stones.

It has also been observed that when social coherence is weak or absent, villages are abandoned more rapidly. Abandonment can be caused by a rise in the death rate of a residential community due to epidemic, famine for several years, or floods, or else because the inhabitants find better soils or better social conditions elsewhere. In this case all that we know is that few Harappan places remained settled in later periods, that new villages were founded in adjacent areas, and that some jewellery caches and heavy items like stone column bases and mortars were left behind, together with vandalized stone statuary.

There is also the matter of about thirty-five skeletons found in the last levels of Mohenjo-daro, some though not all belonging to the last occupation phase of the city. Some of them were hastily buried (we had chanced on one or two in earlier pages), as if the times were so bad that the dead could not be taken out to the cemetery. In the northern part of the lower city, two skeletons lay on some steps of a well room. They lay where they had died, as did a group of five people in the southwestern part of the city. Other unburied skeletons seem to indicate that marauders from outside, or city gangs themselves, fought over the last spoils. If the nerve-centre of the political system suffered a serious blow, the repercussions could have spread far and wide.

Whereas land routes across Afghanistan and Baluchistan had changed at the onset of the Harappan period, there were reversals again at the end of the period. We had said that states establish frontiers and that pastoralists from Baluchistan may not have had easy access to annual grazing in the Indus plains in the Harappan period. But it appears that routes opened up again after 2000 BC, when there were widespread disruptions over the world. In Turkmenia, for example, at the end of the Bronze Age, the Kopet Dag piedmont settlements shrank in size and eleven new settlements were founded along

one arm of the inland delta of the Murghab, in Margiana. The pottery, terracotta and metalwork here are akin to those of late Atyrdepe. Gradually, six oases were so settled in this region. Meanwhile, roughly contemporary abandonments occurred of flourishing villages like Tepe Hissar and Yartim Tepe (the latter in the Gorgan valley) in northeastern Iran.

Near Mehrgarh and Nausharo there lies a very small (one hectare) settlement, briefly occupied, called Sibi. Some of the pottery, figurines, seals and bronze artefacts here have clear parallels in Margiana and Bactria, where walled settlements and metal industries flourished after 2000 BC. There are very characteristic 'violin-shaped' figurines, the profiles curved in an exaggerated manner, schematic representations of the female torso with scant attention to the limbs, in Bactria and at Sibi. Seals in both places are strikingly similar, with compartmented forms. Also, a shaft-hole adze-axe at Sibi appears to derive from Central Asia. This evidence speaks for the resumption of movement down the Bolan Pass after the urban period.



Violin-shaped figurines of Central Asian affinity from Sibi (c. 2000 BC).

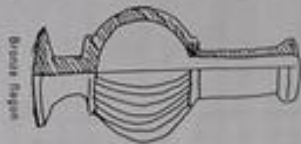


Seals from Pirak (c. 1700 BC).

lines of the camel and the horse, both Central Asiatic animals. Pirak-type pottery occurs at sites in Loralai, the Quetta valley and near Kalat, and thus we can also infer that hill villages re-emerged in Baluchistan after an interregnum, at the same time as the resumption of traffic across Baluchistan into the Kacchi. Meanwhile, in the northernmost mountainous corner of the subcontinent, in Swat, there is also a sequence of culture change. Swat alternated between periods of contact with the greater Indus valley and periods of contact with

Another site in the Kacchi, settled around 1700 BC, is Pirak. It is much larger (about eleven hectares). Here too seals and violin figurines of Central Asian type were found. In addition, there were bones and figurines of the camel and the horse, both Central Asiatic animals. Pirak-type pottery occurs at sites in Loralai, the Quetta valley and near Kalat, and thus we can also infer that hill villages re-emerged in Baluchistan after an interregnum, at the same time as the resumption of traffic across Baluchistan into the Kacchi. Meanwhile, in the northernmost mountainous corner of the subcontinent, in Swat, there is also a sequence of culture change. Swat alternated between periods of contact with the greater Indus valley and periods of contact with

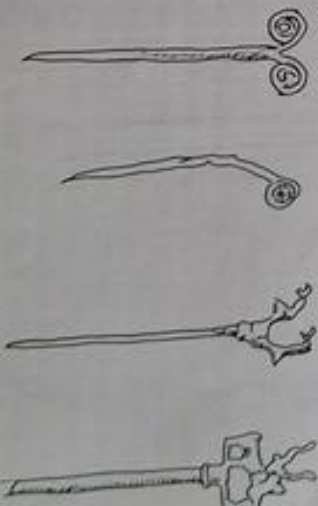
Rare objects of Central Asian affinity at Harappan sites



Bronze figure



A seal from Harappa (see Central Asian parallels above)



Bronze pins with heads in spiral, double spiral, or animal form

Central Asia or northeastern Iran, especially in the matter of some very distinctive pottery.

Around 1800 BC the sea trade between Mesopotamia, Bahrain-Kuwait and India came to an end. In southern Mesopotamia there had been an agricultural decline due to shifts of the Euphrates and soil salinity. As a consequence, individual settlements as well as total settled area shrank appreciably in the south and the political centre of gravity moved northward. The newly important regions of central and northern Iraq developed links with the Levant and Anatolia for their wood and metal requirements, the routes moving along the Euphrates. The culture of Bahrain saw an eclipse in the second millennium. An important trade circuit, a source of wealth for the Harappan elite, had thus dwindled.

The end of its external trade can have serious consequences for an economy if that economy has been structured around trade. We could suggest that an economic structure was dependent on foreign trade if there was expansion of settlement to, or colonization of, mineral resource areas, the establishment of sea-ports, the institution of ancillary activities like forestry and shipbuilding, the deployment of labour for the manufacture of craft items for export, and so on. The end of trade could mean the disintegration of such institutions, so that the population would relocate over the land, with changed economic imperatives/goals. Reversion to individual households engaged in subsistence agriculture and/or pastoralism is a likely consequence.

Material culture resumed its local distinctions and regional differences after 1800 BC. A quick survey of the other successor cultures in the relevant zone now follows (Map 5). Sibri and Pirak have been mentioned above. There was the Jhukar culture in Sind, with buff, Amrian-like pottery, often painted in two colours. It was a materially impoverished culture without a distinct architectural or craft tradition, utilizing stone, bone and some metal tools. The Cemetery H sites on the Hakra plains and in the Cemetery H of Harappa, represent the culture of southern Punjab. No habitation site has been excavated. The pottery is superb, of finer paste and

better fired than the Harappan, a glossy red with black painted stars, peacocks, leaves and other naturalistic elements. Large urns so painted, some on display at the National Museum, Delhi, took fragmentary remains of the dead, or entire skeletons in the case of infants. In the Gomai valley and north up to Sarai Khola, a peculiar system of disposal of the dead became established, the 'grave-cum-funeral pyre'. It consisted of a pile of wood on the floor of a large pit, overlaid with a sacrificed animal, more wood, earth, clay, and wood again, and then the corpse with grave offerings. The whole was sealed with clay and set afire. The grave was never opened thereafter.

Upstream in the Sutlej-Jumna divide, there was an increase in the number of settlements, probably caused by migration from the Hakra. This in turn was probably because the Hakra was gradually drying. M.R. Mughal suggests that the Late Harappan or Cemetery H sites of the Hakra plain lie between Yazman and Fort Derawar because this area received water from an offshoot of the Sutlej, which joined the Hakra near Yazman. This stream also eventually dried up, and sites of the following period lie further upstream, in the dry bed of the Hakra. The drying of the Hakra is mentioned here as a likely cause of abandonment of some sites, but not as a 'cause' of the end of the Harappan civilization. Village abandonments are not the same as civilizational collapse.

The Shivalik's streams that had once fed the Ghaggar and Drsadvati appear to have shifted, to be 'captured' by the Jumna and/or the Sutlej. (The land between the upper Jumna and Sutlej has no high ridges or hills to provide a clear drainage divide.) In the Divide, we have seen, a regional culture had been encapsulated within the Harappan. But when the latter came to an end the old lines of regional distinctions seem to reappear. The subsequent material culture (the Late Siswal) on the upper Ghaggar-Sarasvati shows some remnants of Harappan traditions, plus those of local traditions, in a new combination. The settlements were now rural, with wood and thatch huts and the occasional brick structure. Perforated jars and a few other Harappan ceramic forms survived, but not so the writing, or range of bronze craft tools, or cubical chert weights, or long carnelian beads. Terracotta cakes took new forms, and the locally popular

biconical terracotta bead was transformed. Long chert blades were no longer in use. Ropar on the upper Sutlej continued to be an important centre through the ancient period because of its locational importance, but only after a centuries-long interregnum.

In contrast to the settlement shifts and de-urbanization in the Divide, in Kathiawad there was another kind of transformation, and this has received better scholarly attention. There had been only a few Mature Harappan sites like Rangpur and Lothal here, but for the early second millennium (Rangpur IIB-C and Rangpur III-related phases) we can count more than a hundred sites. There are small settlements in all parts of Kathiawad; developments in Kutch are relatively unknown. Ragi and jowar were to become the mainstay of Kathiawadi agriculture, being better suited to the soil and climatic conditions of the peninsula as a whole than wheat or barley. Thus changes in agriculture may be connected with the proliferation of villages. Meanwhile, in this period the dockyard of Lothal had gone out of use; no Rohri chert was available; and small blades of local jasper came into use. Weights, and shell; faience, gold and carnelian became scarce. At most of the newly-founded villages of this period the houses were made of mud, poles and mats/thatch. Thus there was here, not just a sort of 'devolution' but also development of the subsistence economy in new and sustainable directions.

Mainland Gujarat, along the 'neck' of the Kathiawad peninsula and the eastern edge of the Little Rann, is also a dry, millet-growing region. Post-urban villages in this zone appear to have taken advantage of depressions scattered amongst the sand-dunes that held rain water for some months in the year. There were Nagwada, Ratanpura, and other sites. Millet agriculture is possible, although these locations could also have attracted sheep- and goat-herders during the wet months. In fact, the shallow deposits of one or two of these sites make it probable that they saw seasonal occupation of hunters and gatherers. The small village of Nagwada (1.6 hectares) had wood post and thatch houses, and also stone rubble and mud-brick ones. Material equipment included flaked stone tools in the Harappan tradition and an insufficiently fired pottery. At Ratanpura, round huts and many rubbish pits yielded flaked stone tools, animal bones and some pottery that included a ware related to Rangpur III pottery.

Except for bead production at Nagwada, crafts are not in abundance.²

In summary, the majority of towns and villages of the Harappan culture failed to see sustained occupation after about 1800 BC, and people seem to have emigrated. Routes of movement across the Afghan and Baluch uplands changed; in northwestern Afghanistan, Turkmenia and northeastern Iran also there were settlement abandonments at roughly this time. In settlement form, metallurgy, writing system, house construction, crafts using ivory or carnelian, or in the use of seals, as also in major aspects like city life and maritime orientations, there was very little continuity of the Bronze Age way of life. There was, instead, a reversion to rural, tribal cultures of what we call the chalcolithic stage, in which metal may have been in use but was not an essential or frequently-utilized material for tools of production.

We have surveyed the evidence for abandonments, natural calamities and environmental degradation. We have also touched on internal factors such as political strife, and on the eclipse of the overseas trade. Sibri and Pirak testify to the renewal of movements between Central Asia and South Asia. Hopefully a perspective has thus been provided for the problem of the 'Aryan invasion'.

² Mention needs to be made of the site of Daimabad, south of Nasik and on the left bank of the Pravara river, a tributary of the Godavari. Four huge bronze sculptures, obviously executed in lost wax technique, were found here. There is a man driving a two-oxen chariot, an elephant, a rhinoceros and a buffalo—all animals known on the Harappan seals. The animals are on two-wheeled stands, the wheels being solid like the Harappan wheels. The four pieces together weigh 65 kilograms. Considering the above features and the scarcity of metal in the post-Harappan chalcolithic cultures, some scholars are inclined to interpret the Daimabad bronzes as Harappan. Others ask if they could be much later, say, tribal work, of the eighteenth century. What needs to be said is that these did not show up in controlled excavation but were unearthed by Bhil farmers when they were digging out the roots of a tree. In excavations of the mound of Daimabad, material from the second period of occupation is, according to B.B. Lal, 'suggestive of a Late Harappan occupation'. But the 'sturdy red ware', button-shaped terracotta seals, signs inscribed and painted on pottery, and one mud-brick-lined grave are not totally convincing as Harappan.

The grassland or steppe of southern Europe, which extends into Central Asia, is accepted as the original home of the Indo-Europeans for two major reasons. First, early Indo-European and early Finno-Ugric (or Uralic) languages form two contrasting families but did have contacts and mutual influence, as can be made out by linguists from the large numbers of words they acquired from each other. This could only have been possible if the two languages had been spoken in neighbouring regions. The home of the Finno-Ugric languages (Finnish, Hungarian, Estonian, Volgaic, etc.) is undisputed: it is the southern forest belt of Europe west of the Urals. Therefore the steppeland of Eurasia immediately south of that forest belt would be the home of the Indo-Europeans.

Second, there is no disputing the fact that the horse was known to the earliest (or 'Proto') Indo-Europeans. Ample archaeological evidence attests to horse domestication, horse-herding and even horse-riding (bit-marks on horse teeth) at early sites on the Eurasian steppe. The wild horse was indigenous to this region and was domesticated here. Moreover, in all Indo-European languages (Latin, Mitannian, Sanskrit, etc.) the word for horse is derived from the same Proto-Indo-European root, *ekwos*. The social and military importance of the horse to the early Indo-Europeans in Syria and Anatolia, in northwestern South Asia, and in Iran, is well established. Archaeologists have discovered several third- and second-millennium sites and cultures in the Eurasian steppe, but these can only generally be linked with the Indo-Europeans, that too not with certainty.

There is evidence for movements out of Central Asia, the homeland of the Indo-Europeans and their Indo-Iranian branch, after about 2000 BC. We had seen that settlements like Yarim Tepe and Hissar were abandoned, so too settlements in southern Turkmenia. In southern Baluchistan we find new kinds of pottery, seals and burial practices, which also point to newcomers. At Sibri and Pirak we had seen the influx of Central Asian elements. In the Gardan Reg of Afghanistan lie extensive ruins of copper-smelting activity that date to this period (roughly 2000 BC), and may also be evidence for the movements of metallurgist groups in search of sources of copper/tin. None of these, however, is proof of the movement of people speaking a particular kind of language. There is no necessary link between a particular kind of material culture and its geographic

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boundaries on the one hand, and a specific language and its boundaries on the other. In other words, there is no obvious archaeological identification of a linguistic entity such as Indo-Iranian, Iranian, or Indo-Aryan. We can only confirm that the movements and migrations reconstructed by historical linguistics are not contradicted by archaeological evidence for migrations, in terms of period and direction of movement.

Indo-Aryan is the name of a group of Indian languages that were, around 2000 BC, part of the family of Indo-Iranian languages,³ a group which had branched out from the Indo-European homeland. On the southern and eastern frontiers of the Indo-European homeland lay the Turkmenian settlements, and also a number of villages of the Gurgan valley, with Tepe Hissar a little further south. Any tribal schism or pastoral or military emigration out of the steppe could have repercussions on communities along these frontier zones. Therefore, the widespread abandonment of sites in Turkmenia and the Gurgan valley, and of Tepe Hissar, to which we have referred, does suggest outmigration from the steppe. But we cannot identify the emigrants as speakers of Indo-Iranian except at the level of reasonable probability.

It is also relevant that a language does not have to move into an area on the crest of an invasion. There is little evidence to support the idea that those who spoke Vedic Sanskrit were destroyers or marauders, or that they left a trail of burned settlements in their wake. Language replacement has occurred repeatedly in history. For example, around 2000 BC the Semitic language Akkadian replaced Sumerian, which had been the spoken and written language for almost a millennium in Mesopotamia. Sumerian and Akkadian are unrelated ✓

³ Old Avestan is the earliest known Iranian language. It is the language of the *Gathas* or the hymns of Zarathushtra, which are set in Central Asia-northeastern Iran, in a rural, cattle-keeping culture. It is argued that Zarathushtra dates much before the period of the Zoroastrian Achaemenid kings (sixth century BC) because of close linguistic similarities between Old Avestan and the language of the *Rgveda*. For example, in Avestan the words for camel, charioteer, cow and horse are *ushtra*, *rathis*, *gau* and *aspa*, easily recognizable to those who know Sanskrit. Old Persian, the language of the Achaemenid kings (for example, the inscriptions of Darius), is a separate, southwestern Iranian language, and probably much younger than eastern Iranian Avestan.

languages, yet Akkadian adopted the Sumerian script, with modifications. But there was no accompanying break in material culture nor a demographic hiatus of any sort. Often languages with high political or social status are adopted by speakers of other languages, initially as a second language. After such an onset of bilingualism, the high-status language may gain currency in an increasing number of social situations and thus become the dominant language. So language replacements are not necessarily caused by massive migrations of the speakers of a new language.

Next, even though there are hints of movements of people with Central Asian connections into South Asia, these traces are more marked in the fringes of Harappan territory—in Sibri-Pirak, Baluchistan, and the remote Swat valley in northernmost Pakistan—than in the Harappan heartland. When we referred to the scatter of unburied skeletons in the uppermost strata of Mohenjo-daro, it was to infer the existence of strife, or the collapse of social order, rather than to detect the 'hand' of 'the Aryans'. The movement of Indo-Aryans and the end of the Harappan civilization cannot therefore be seen as causally connected.

Whatever the weightage we may choose to give to various internal and external processes in the eclipse of the Indus civilization, another question arises. Are we dealing with a social and economic system that carried the seeds of its own destruction? If the economy was, as we suspect, dependent on bronze tools that could be procured by elite-organized external trade, then a series of mishaps or dislocations in the world around (tribal movements, new settlements, decline of the power of certain elite groups, shifts in pastoral routes) could bring an end to that procurement. Local deforestation in the copper-smelting regions is also a factor we may consider. Copper technology is hugely wasteful of wood (charcoal).

The critical role of the elite in trade, crafts and the founding of new settlements could also have meant that the economy was denied a secure foundation. Perhaps only those innovations and systems endure that are firmly rooted in the control of the individual family or village community and serve the interests of ordinary people (rather than rulers ensconced in citadels), and in which the knowledge of techniques is internalized into a people's heritage. Faience, bronze, seal-carving or ivory-inlaid furniture could have

relied on elite taste/sponsorship or demand; but experience with different soils and rainfall regimes, knowledge of different varieties of crop, observation of animal breeding behaviour and the fuel properties of different trees, these would be part of popular science and would endure. So the house forms and construction techniques of Mohenjo-daro did not endure. Production of carnelian beads reappeared very much later, at iron age Ujjain at the end of the first millennium BC and in the south at iron age sites like Kodumanal, but the output was small beads, and the technique of making long and slender ones appears to have been lost. Lost wax casting is next attested only at Taxila in the early first millennium AD. It appears that soon after 3000 BC society leaped, as it were, into a new technological frontier that could not be sustained over the long term. Perhaps the new social institutions did not develop sufficiently, or take adequately firm roots, to prevent the resurgence of tribalism.

This said, the 'moral' of our story enunciated, it still remains that the Harappan was a remarkably cosmopolitan and outward-looking phase of South Asian history. The Harappan world was an open one with foreign trade, external influences and migrations. The urban centres had interactions with the hunters of Rajasthan, tribesmen in Makran and settlers in Kashmir. The people had developed a taste for exotic stones and forest produce such as ivory. Meluhha entered the literary tradition of Mesopotamia as a source of exotic wares and fine boats, and those Harappans who returned from ventures abroad must have had fascinating experiences to narrate. We could say that cultural dynamism lies in openness, interaction, inter-marriage and bilingualism, not in cultural closure or ethnic purity. And in some ways a spectacular failure of the past can be of as much interest as the lineages of steady continuity that we call tradition.